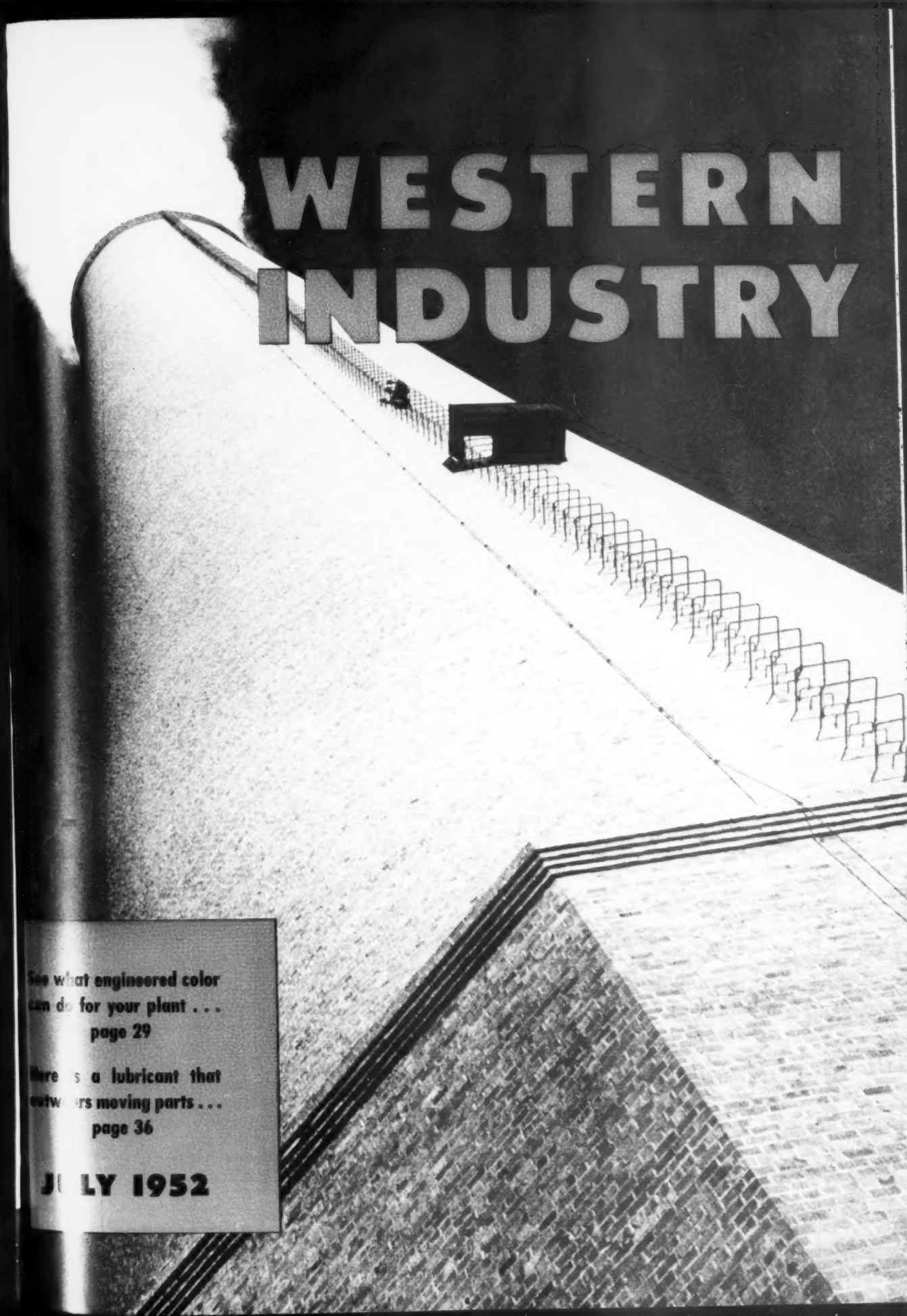

WESTERN INDUSTRY

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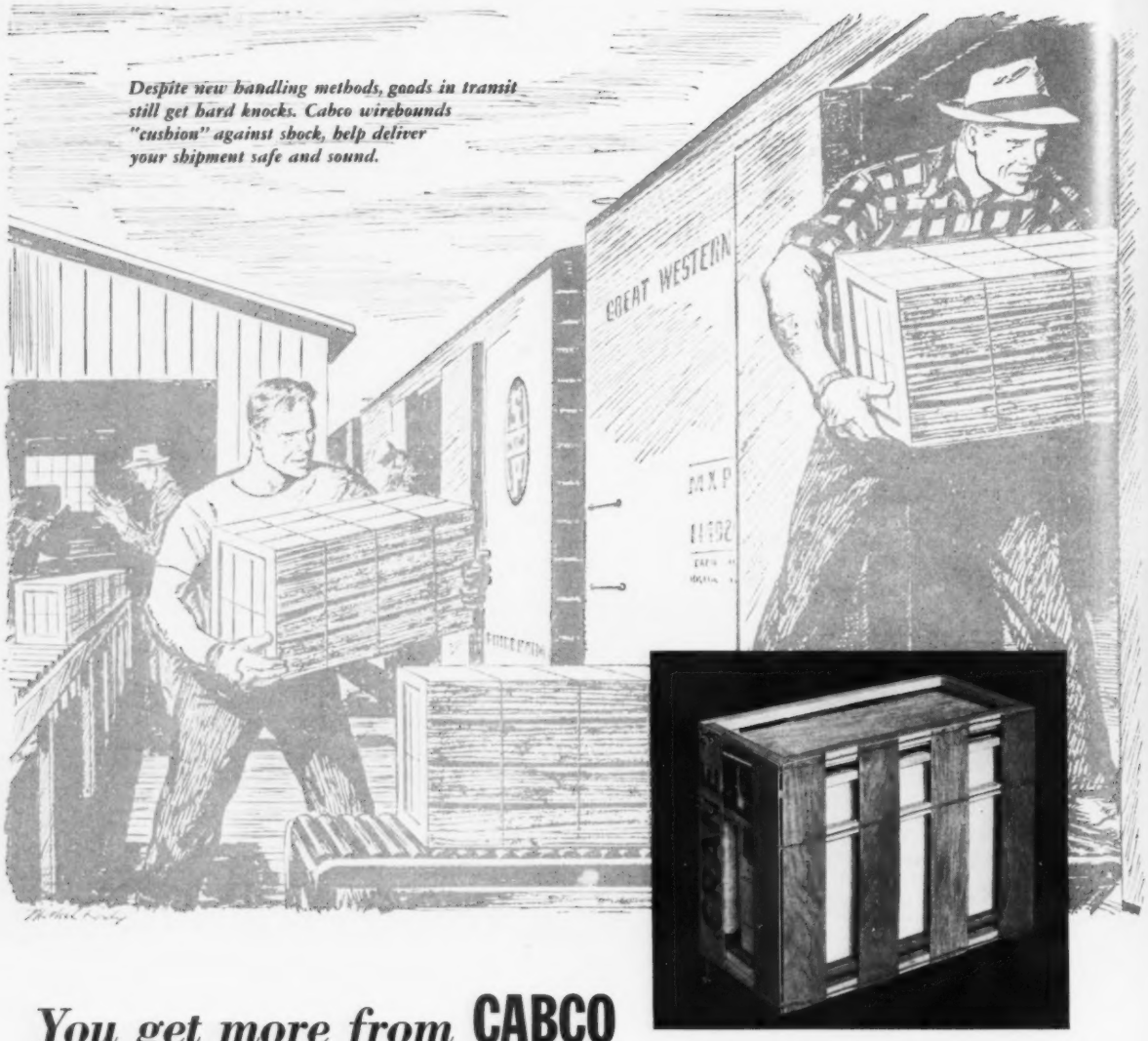
Here is a lubricant that outwears moving parts . . . page 36

JULY 1952



Despite new handling methods, goods in transit still get hard knocks. Cabco wirebounds "cushion" against shock, help deliver your shipment safe and sound.

You get more from CABCO

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"Give" and "take" are essential ingredients of Cabco containers. There's more "give"—more *resiliency*—to absorb shocks, protect produce and manufactured goods. And there's more "take" where punishment is concerned. All because Cabco has made a lifetime study of wooden shipping containers—because we control every manufacturing step from our timberstands to the finished container. Add to this streamlined "one-company" production system the design experience of Cabco engineers, and it's easy to see why you get *more* from Cabco!

LEADING PLUMBING MANUFACTURERS ship tanks, bowls, lavatories—even tubs and heavy shower bases in wooden wirebounds. Wirebound containers are light weight, yet offer superior protection, cushion travel shocks because of inherent "flex" action, sturdy construction. They permit high stacking in warehouse, and palletize or handle easily with lift or hand truck. Open construction permits quick identification of contents.

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WESTERN INDUSTRY

VOLUME XVII | JULY • 1952 | NUMBER 7

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FRONT COVER

Anaconda Copper Mining Company's "Big Stack" at Anaconda, Montana, towers 585 ft. above the ground, is 75 ft. in diameter at the bottom, 60 ft. at the top, and takes care of four million cubic feet of gases per minute. Electrical dust treaters at the base catch minute particles of zinc and arsenic for recovery for commercial use.

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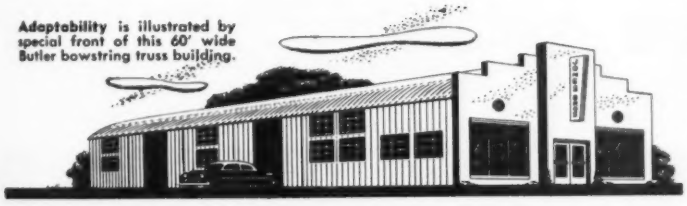
Maximum usable space is assured by rigid frame construction of this 32' wide Butler Building.

Yes, low cost, fire-safe, adaptable Butler Steel Buildings answer your need for variations in width, length, height. And Butler straight sidewalls and truss-clear, column-free construction assure full usable space.

Butler Steel Buildings are made at our Richmond, Calif., plant, for convenient delivery to West Coast industry. In days instead of weeks, your Butler Building can be ready for long-life use. For a Butler Steel Building to fit *your* needs, see your Butler dealer or mail this coupon today.

Adaptability is illustrated by special front of this 60' wide Butler bowstring truss building.



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IDEAL CEMENT CO. uses G-E Pacific Gear-motors throughout packing plant. Above, G-E Gear-motor drives a truck loader.

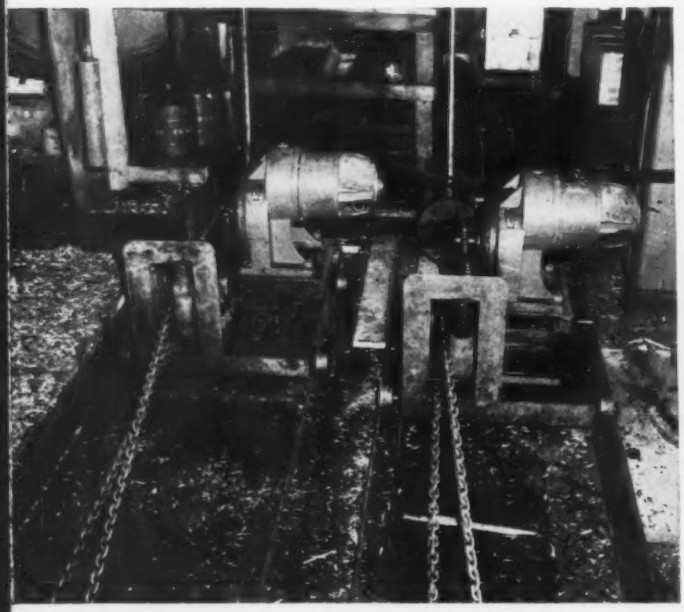
Three More Plants Choose G-E Pacific Gear-motors

ONE PLANT REPORTS SPACE SAVINGS, OTHERS LOW MAINTENANCE, RELIABILITY

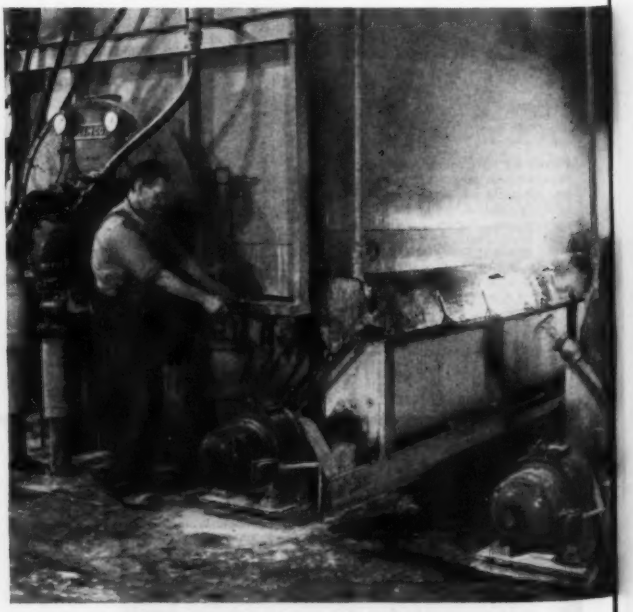
A large cement company, a lumber mill, and a prominent sugar refinery have been added to the growing list of Western industries profitably using General Electric Pacific Gear-motors for low-speed drives.

For example, every operation in the packing plant of the Ideal Cement Company, Devils Slide, Utah, has been recently motorized with G-E Pacific Gear-motors. The plant reports savings in floor space and initial cost over any chain drive and separate speed reducer investigated. Similar reports from other industries point to savings in maintenance costs, and years of reliable operation.

Prompt Delivery is assured from warehouse stocks in eight key Western areas. And because G-E Pacific Gear-motors are manufactured on the West Coast, factory shipment is fast and dependable. General Electric Co., Schenectady 5, N. Y. 736-1



WEST COAST LUMBER INDUSTRY likes G-E Pacific Gear-motors for heavy work. Above, G-E Gear-motors drive debarker.



AMERICAN CRYSTAL SUGAR CO. wanted modern drive, picked G-E Gear-motors to power rotary filters in beet sugar plant.

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

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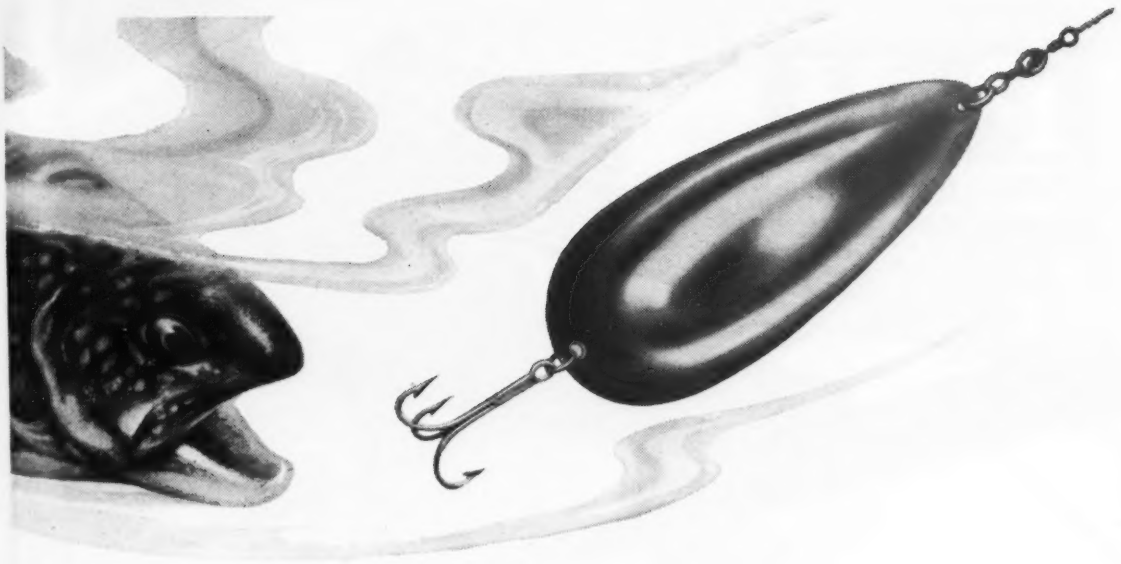


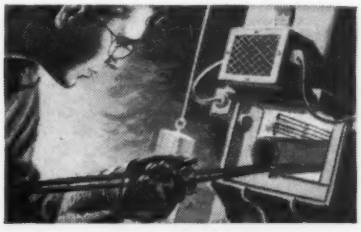
What's the big attraction?

The same brilliance that catches Mr. Trout's eye is also found on a wide range of brass and copper products, from costume jewelry to the gleaming brightwork on a ship.

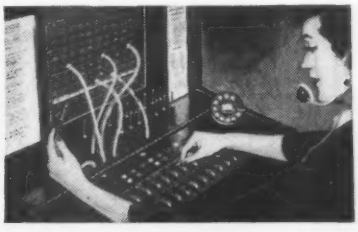
The clean, bright surface of Chase metals doesn't just happen . . . it is controlled in research laboratories by Chase metallurgists . . . it is checked and tested every step along the way to the finished sheet, rod, wire or tube.

Chase brass and copper products are available, subject to government controls, through dealers, and jobbers across the nation and through Chase's 23 convenient mill warehouses. Chase Brass & Copper Co., Incorporated, Waterbury 20, Conn.

Chase brass and other copper alloys range in color from rich red to bright yellow. The right color for each product and use is one of the features of Chase research and quality control.



When the Chase Technical Advisory Service is asked to solve a problem by a manufacturer, Chase metallurgists will often find the right answer in this research laboratory test furnace.



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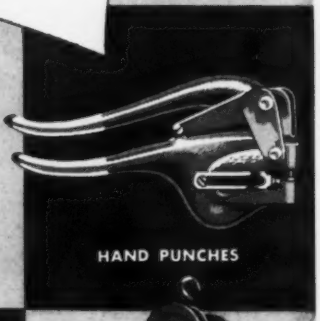
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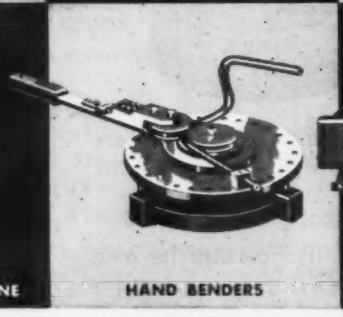
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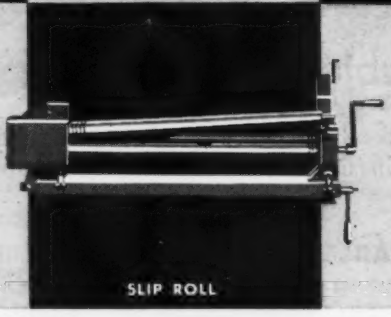
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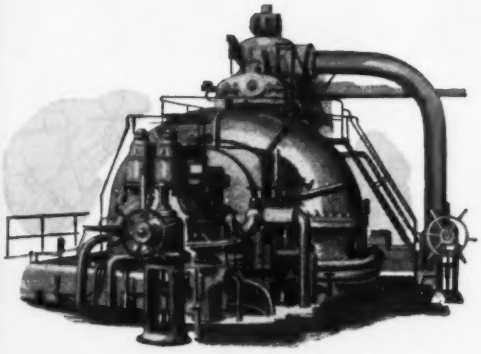

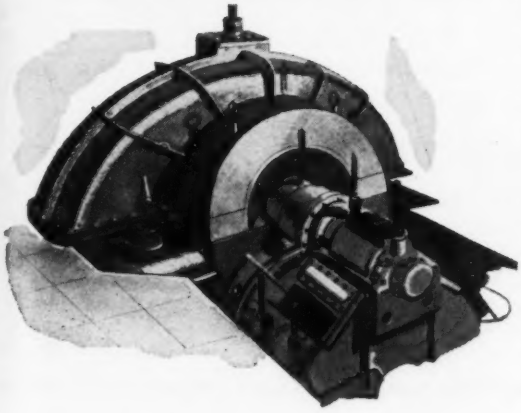

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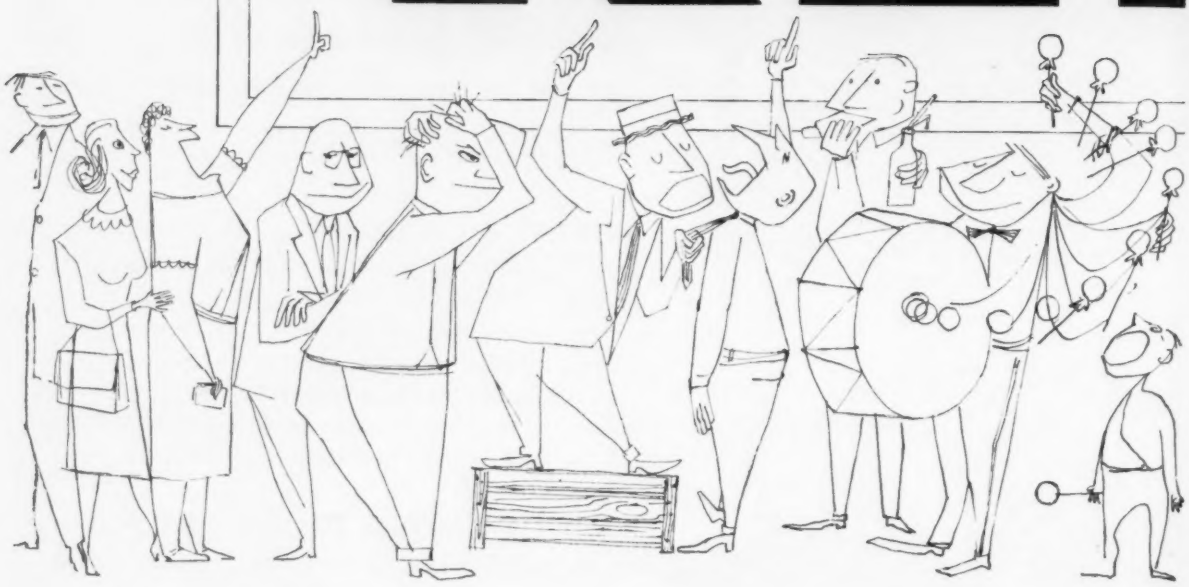

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EMERGENCY

A nontechnical report to management concerning profits

They did what you can do to save time

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On a Friday afternoon, Westinghouse received this call:

> "One of our pump motors has failed. Water is starting to flood the 1400-foot level in our mine. It will rise and flood the pumping station if the motor isn't repaired quickly. Can you help us?"

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This same time- and equipment-saving technique applies to every industry, every maintenance problem. It is a part of the total Westinghouse services that you can use to your profit — for application, installation, emergency or periodic repair.

We want to do the kind of planning with you that uses our Certified Maintenance service — before emergencies arise — to save time, to save money, to produce more with what you have. Your nearest Westinghouse office can show you how. Westinghouse Electric Corporation, Pittsburgh, Pennsylvania.

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ELECTRUNITE tubing is different because the uniformity of the wall thickness is maintained throughout the entire tube. It offers the product designer many advantages because of its consistent uniformity from every fabrication standpoint. It can be precisely processed to meet all requirements.

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ELECTRUNITE tubing is exceptionally versatile, efficient and economical. It will bend, flare, flange, weld, swedge and plate. It offers beauty, stability and outstanding uniformity. It is being widely used for hundreds of products requiring tubing as a basic material.

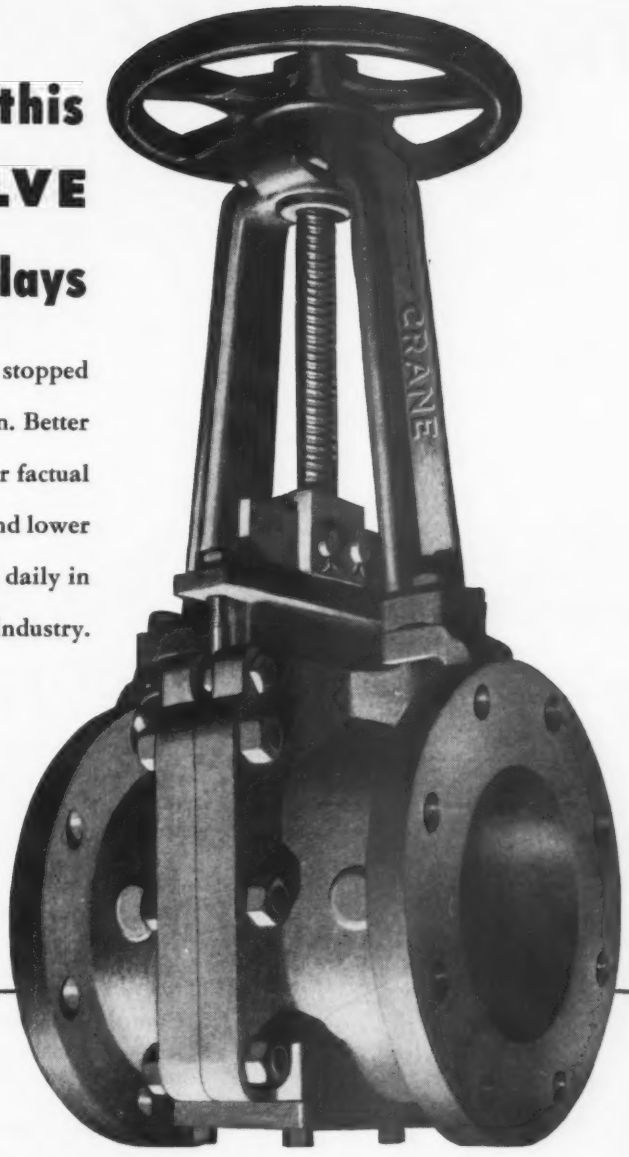
the source . . .

DUCOMMUN metallurgists are thoroughly schooled in the physical properties of ELECTRUNITE tubing and the fabricating techniques that have made it so widely used. Complete ranges of ELECTRUNITE welded mechanical tubing are part of Ducommun's expansive stocks which include upwards of 60,000 industrial items. Call Ducommun often for assistance on production problems . . . for all industrial supplies.

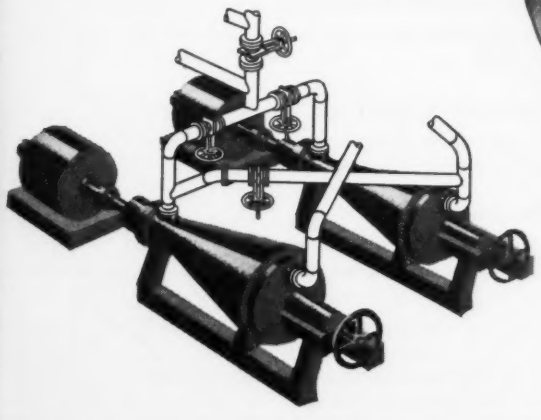
DUCOMMUN

this CRANE VALVE cured production delays

Here's another case where Crane valves stopped serious and costly interruptions of production. Better valve design did the trick. It's another factual demonstration of the greater dependability and lower ultimate cost of Crane valves, duplicated daily in thousands of plants in every industry.



Here are the Facts!



Where Installed: In a paper mill making strong and heavy papers for manufacture of bags. ***Fluid Handled:*** High consistency pulp stock being piped from pulpers to Jordan machines for refinement.

Trouble Encountered: Valves formerly used, even wide open, would entrap the pulp stock, become inoperative, and shut off flow to machines. Cleaning out the clogged valves and pipe lines was costly in time, labor, and production loss.

Solution and Result: Crane patented Pulp Stock Valves were installed. Clogging was immediately stopped. Not a single shutdown for cleanout needed for more than 5 years since Crane valves were installed.

More CRANE VALVES *are used than any other make*

CRANE CO. General Offices: 836 S. Michigan Ave., Chicago 5, Branches and Wholesalers Serving All Industrial Areas

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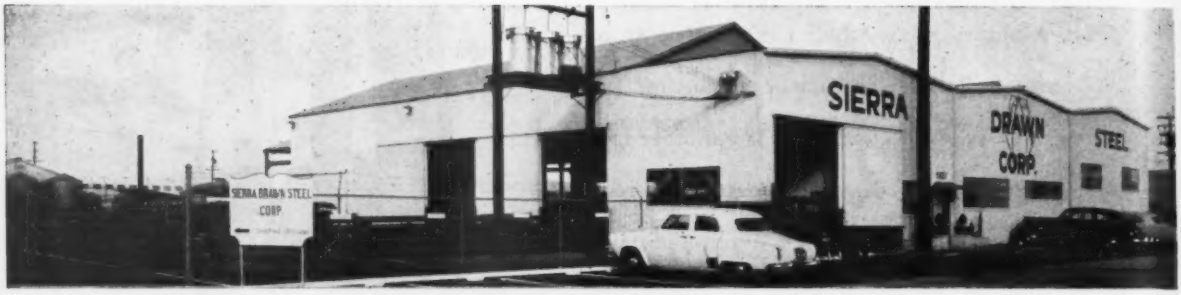

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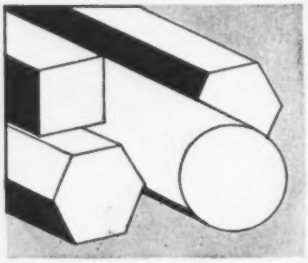

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Here at Sierra we realize our obligation to our customers. All of us continuously try to remember that plenty of business now is not an excuse for ignoring your problems, your requirements, and your desire for prompt, accurate and courteous service.

We do the best we possibly can to give you the same type of service you would expect if you were in a buyer's market.

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Competent steel engineers, experts of many years' standing in the field, can help you meet your needs.

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Up-to-date control and co-ordination, modern equipment, and production "know-how" permit versatile change-over in production schedules.

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All elements are geared to give you the steel you want . . . as you want it . . . with precision and dispatch.

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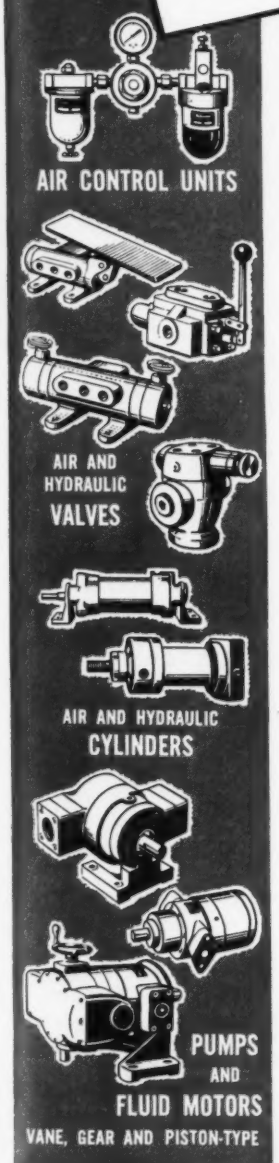

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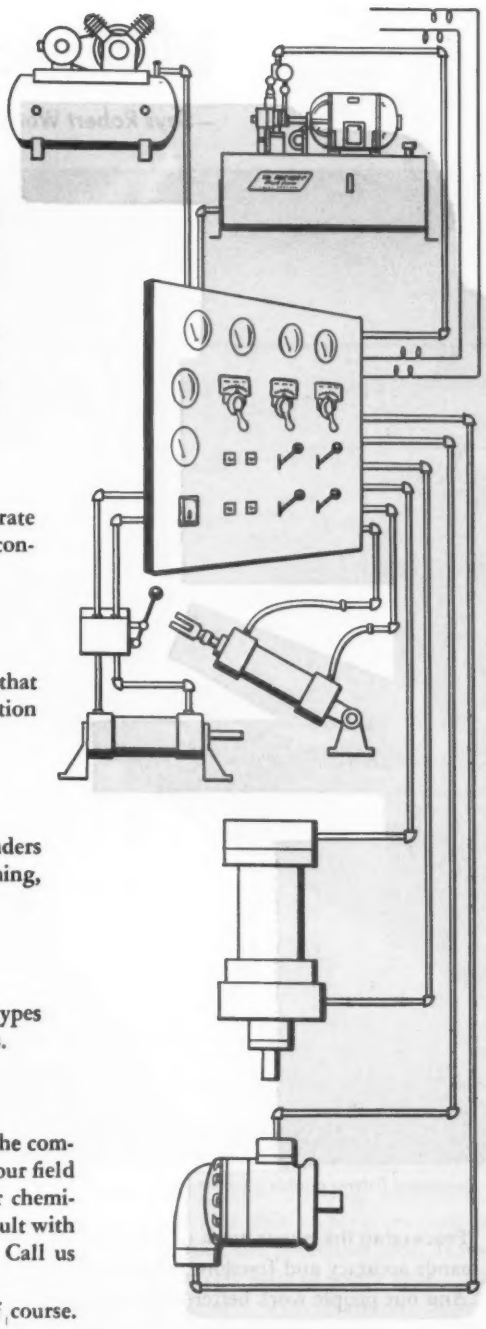

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—Says Robert Waters, Jr., Vice-President of James F. Waters, Inc., San Francisco

Fluorescent fixtures provide glareless illumination in James F. Waters, Inc., main office

"Processing the paper work of our sales of new and used cars demands accuracy and freedom from eye strain," writes Mr. Waters. "And our people work better under the lighting we have installed. We never lose sight of a new sale because of poor light!"

This is just one example of how modern lighting has paid off by improving efficiency in offices and factories throughout the West. On file at P. G. and E. are case histories of planned lighting in businesses similar to yours. We'll be glad to send these lighting results to you on request.

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Good Lighting is a Good Investment

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Reduces waste

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7AX-52

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PACIFIC GAS AND ELECTRIC COMPANY

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The experience of the Industrial Products Division personnel is of such wide range that it renders service to many different industries in many and varied ways—such as casting, forging, welding, machining, heat treating, assembling.

These facilities and this experience can be useful on the big jobs, the precision jobs, as well as the new and special jobs of every type. Why not discuss the details with National Supply, which serves western industry from its conveniently-located Torrance plant?

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MELTING • FORGING • CASTING • MACHINING • HEAT TREATING
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EDITORIAL COMMENT

A Peek Into The Future

HENRY KAISER forecasts that the West's growth up to now in population, businesses and industries is merely a prelude to much greater achievements.

He says the time has come to criss-cross the country East to West and North to South with high-speed superhighways, which might easily be self-liquidating, if the Pennsylvania Turnpike is a safe guide. He considers vast grids of freeways, bridges and rapid transportation systems in the metropolitan centers as things which we cannot afford not to have.

As for the population base needed to support such developments, he believes Governor Earl Warren's expectation of 20 billion population in California by 1970 is an under-estimate; he thinks it will take less time than that to reach 20 billion.

Mr. Kaiser's forecast of fleets of passenger and freight planes multiplied by thousands, driven by astoundingly improved power packages, is really not much more than a resumé of information published in the last year in *Western Industry*. It was only 25 years ago that Lindbergh's solitary transatlantic flight was an astounding feat; yet today crossing either the Atlantic or the Pacific by air is nothing more than every-day ferry service.

Equally intriguing, if not more so, is the picture drawn by Stanley Hiller, Jr., who manufactures helicopters in Palo Alto, California. He foresees a transcontinental air terminal halfway between San Francisco and Los Angeles, and another midway between New York and Washington, laid out with so much ground around them that the fastest planes possible to manufacture could not cause disasters like those at Newark. From these terminals the cities on either coast would be served by helicopter.

Sorry we cannot give our readers a preview of the kind of magazine *Western Industry* will be 25 years hence. We'd be interested to know ourselves. Forecasts from readers will be highly welcome.

Let Go of Uncle Sam's Coat Tail

WHY is it that so many of our Western People feel that the federal government is the only source of capital for big development projects, while at the same time deploring government extravagance, lax management methods and the delays and uncertainties resulting from having to deal with Congress? Hasn't the time arrived for the West to start and follow through on a program of looking to other sources, where the decisions can be made purely on a business basis?

This is nothing that can be accomplished overnight, and there are plenty of obstacles to be overcome. But since private financing is the most logical way to do the job, in the last analysis, why not begin right now to lay the ground work? The goal will never be reached without going through a lot of laborious and perhaps discouraging preliminaries.

It is encouraging to see that some of the private ultilities in the Pacific Northwest are beginning to make some headway in this direction, but there needs to be more general recognition of the real basic facts.

IN OUR MAILBOX

Horatio Alger Still Lives

Editor, *Western Industry:*

Will you kindly advise at your earliest convenience the address of Mr. Frank C. Russell, National Chairman of the Horatio Alger Awards Committee?

We would like to contact him for further information relative to the Horatio Alger organization.

Having personally received inspiration as a youngster from Horatio Alger I feel that an extensive program directed to the young generation may be the deciding factor in properly steering our Ship of State toward a better future, if it is not too late.

Your early reply will be appreciated.

Very truly yours,
HOWARD M. CROW
Lindsay Manufacturing Co., Inc.
Lindsay, Calif.

(The Horatio Alger Awards Committee is sponsored by the American Schools and Colleges Association, 30 Rockefeller Plaza, New York City.)

* * *

Challenge to the West

Editor, *Western Industry:*

Your January article, "Six Questions About Western Industrial Trends," is very interesting and I think that we need more articles of this type analyzing our business and economic situation in the West.

I believe, in general, I agree with the answers to the questions. However, in some cases more stress could have been given to the importance of Western unity. Another point that I think should have been stressed is the importance of foreign trade to the West. Certainly, civilization is continually moving westward and our hope, it seems, is to develop foreign trade. This will be important, not only from the standpoint of the West, but for the nation as a whole. I would be interested in seeing an article in your magazine stressing the importance of foreign trade to the West.

Putting it frankly and mildly, I really liked Mr. Walsh's last chapter in the May issue, "Is the West Getting Its Share?" The article was nicely edited and certainly came to the point: I liked particularly the analysis of the term "Industrial Promotion."

Then, too, being a newcomer to this area, I was not aware that none of the Eleven Western States carry on national advertising at the present time.

This article, in my estimation, certainly presents a challenge to the West. I hope that it will be the forerunner of unified development.

RALPH W. BACKSTROM
Western Agricultural Development Agent
Great Northern Railway Company
Seattle, Wash.

(We frankly expect that the article "Is the West Getting Its Share?" will draw much comment, and that we will have more letters regarding it in the September issue.)

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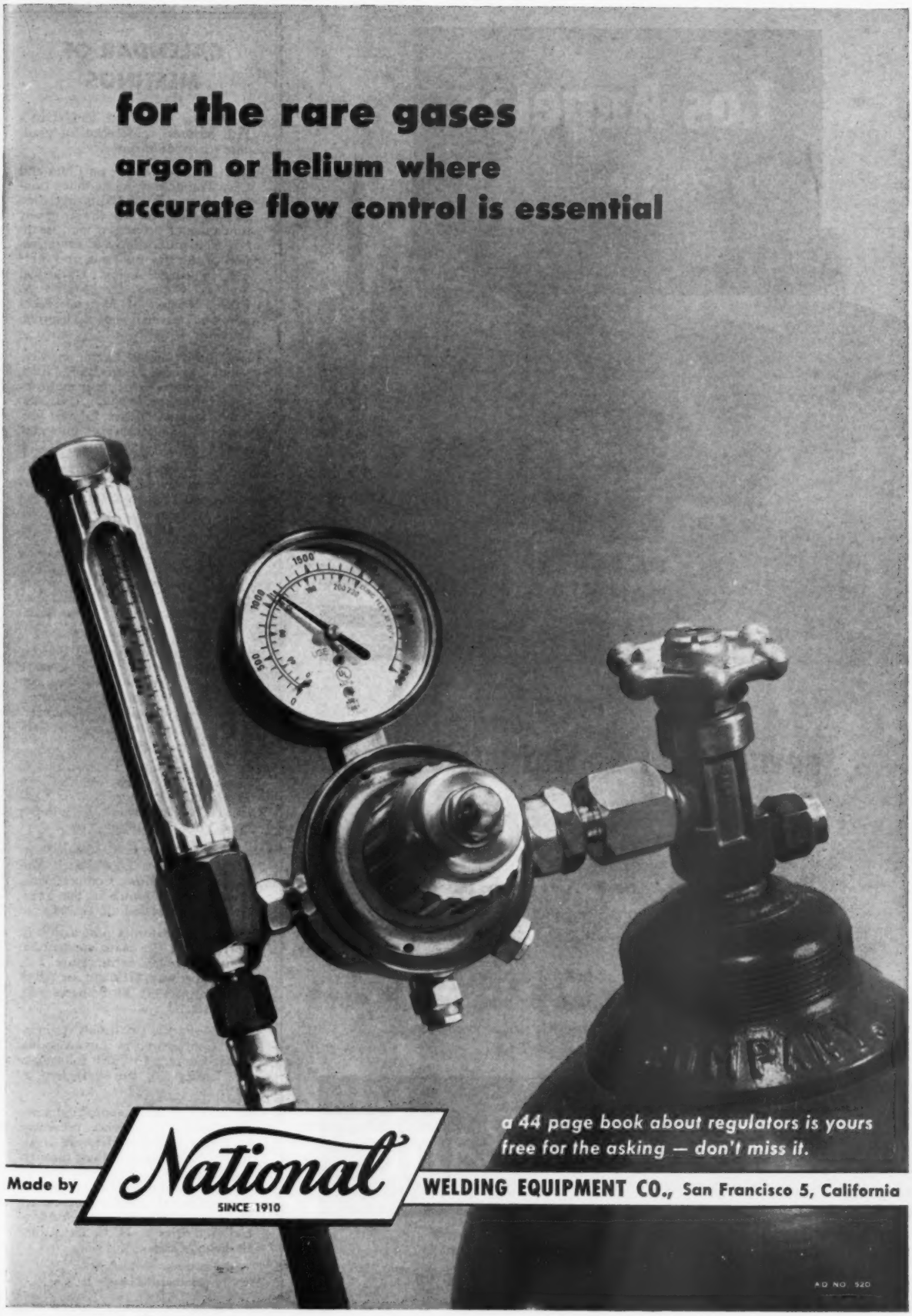

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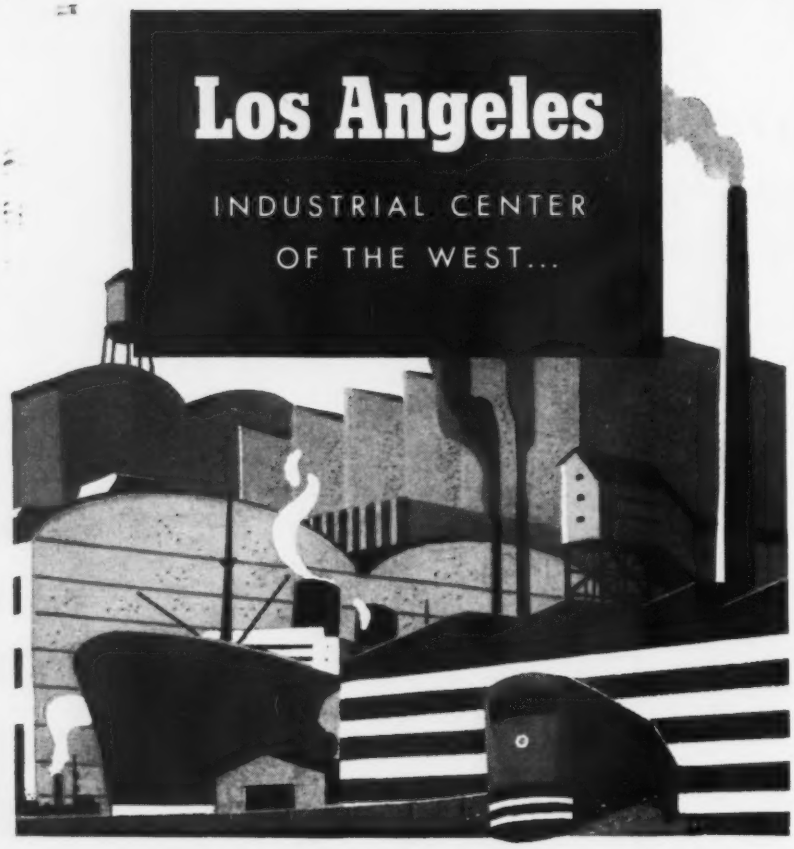

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CALENDAR OF MEETINGS

July 21-25 — Stanford University's 11th business conference for graduate school of business.

July 21-25—Conference on Clays and Clay Technology, at Berkeley campus, University of California. Discussion topics include the structure, fundamental properties, and methods of identification and investigation of the clay minerals, and their uses in various fields of practical interest. Contact Dr. Joseph A. Pask, Division of Mineral Technology, University of California, Berkeley 4, Calif.

Aug. 9—Northwest Engineers Centennial at the Multnomah Hotel, Portland, Ore. General theme to be engineering profession's civic and public responsibilities. Contact Professional Engineers of Oregon, 1940 S. W. 4th Ave., Portland, Ore.

Aug. 11-13—Society of Automotive Engineers meeting, at Hotel Fairmont, San Francisco. Contact John A. C. Warner, Sec. and Gen. Mgr., 29 W. 39th St., New York 18, N. Y.

Aug. 12-14—4th Western Packaging and Materials Handling Exposition, Shrine Convention Hall, Los Angeles. Contact Clapp & Poliak, Inc., 769 Monadnock Bldg., San Francisco.

Aug. 13-14—Second biennial Packaging and Materials Handling Institute, Shrine Auditorium, Los Angeles. Contact: John R. Huffman, Department of Industrial Engineering, University of Southern California, Los Angeles.

Aug. 19-22 — American Institute of Electrical Engineers, Pacific General Meeting in Phoenix, Ariz. Contact H. H. Henline, 33 W. 39th St., New York City 18, N. Y.

Aug. 27-29—Western Electronic Show and Convention, Long Beach Municipal Auditorium. Contact Heckert Parker, 108 Ninth St., San Francisco, Calif., HEmlock 1-2525.

September—California Association of Port Authorities state convention. Contact Dudley Frost, Suite 215, 1419 Broadway, Oakland, or Alvin K. Maddy, 1333 El Embarcadero, Long Beach.

Sept. 3-5—Pacific Coast Gas Association Conference, in Los Angeles, Calif. Contact Clifford Johnstone, 447 Sutter St., San Francisco 8, Calif.

Sept. 10-13—Fourth annual Summer Management Conference, presented by University of California Institute of Industrial Relations through facilities of U. C. Extension, will be held at Ahwahnee Hotel, Yosemite. For additional information, contact Department of Conferences and Special Activities at U. C. Extension, Berkeley, Calif.

Continued on page 26

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CALENDAR OF MEETINGS

Begins on page 24

Sept. 12-16—Tenth National Instrument Conference and Exhibit, Los Angeles, Calif.

Sept. 14-20 — Concrete Reinforcing Steel Institute, semi-annual meeting, at Broadmoor Hotel, Colorado Springs, Colo. Contact Association headquarters, 38 So. Dearborn St., Chicago, Ill.

Sept. 15-18—American Mining Congress Metal Mining Convention and Exposition, in Denver, Colo. Contact J. D. Conover, 1102 Ring Bldg., Washington 6, D. C.

Sept. 22-25—American Mining Congress, biennial metal and nonmetallic mineral mining convention and exposition, in Denver. Contact Society headquarters, 1200 18th St., Washington, D. C.

Sept. 28-30—Pacific Northwest Trade Association, fall conference, Yakima. Contact D. C. Knapp, executive secretary, 219 Olympic Hotel, Seattle.

Oct. 1-2—California Manufacturers Association statewide meeting. Contact Mr. John Knauft, 315 W. 9th St., Los Angeles 15.

Oct. 11-14—National Association of Waste Material Dealers, fall meeting at Hotel Ambassador, Los Angeles. Contact association headquarters, 271 Madison Ave., New York.

Oct. 12-16—National Canvas Goods Manufacturers Association national meeting. Contact Fred W. Behnke, 1132 Mission St., San Francisco.

Oct. 17-18—Northwest Personnel Association regional conference at Davenport Hotel, Spokane, Wash. Contact Marion R. Jenkins, Whitworth College.

Oct. 21-23—28th Pacific Coast Management Conference, at Claremont Hotel, Berkeley. Contact Everett Van Every, Secty.-Mgr., California Personnel Management Association, Farm Credit Bldg., Berkeley 4, Calif.

Oct. 28-31 — American Waterworks Assn., California Section, in Pasadena, Calif. Contact A. R. Houseman, 907 Monadnock Bldg., San Francisco, Calif.

Nov. 9-10 — California Refrigerated Locker Association state convention. Contact Morris W. Walker, convention chairman, 372 Castro St., Hayward, Calif.

Nov. 10-12—California Fertilizer Association Convention, at Desert Inn, Palm Springs, Calif. Contact Sidney H. Bierly, Exec. Sec. and Mgr., 4700 District Blvd., Los Angeles 58, Calif.

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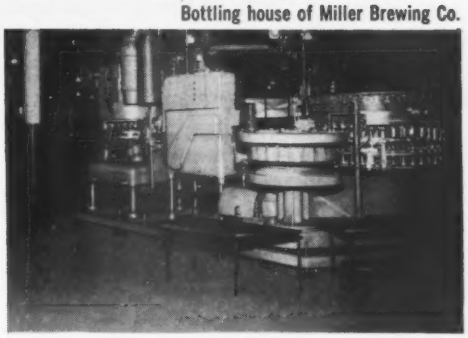

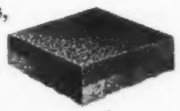

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A Quick Picture of Steel Stocks

What about current Ryerson stocks?

When the steel strike was called early in June our over-all stocks, though still out of balance from a size standpoint, were better then they had been for some months. Naturally we have been losing inventory since then. But here is the picture as these lines are written—6/25/52.

Our stocks of both carbon and alloy steel bars are quite spotty with larger diameter bars in short supply, the smaller sizes somewhat better. In carbon steel, cold finished bar stocks are better than hot rolled stocks. In alloys, carburizing types are the most plentiful.

Our stocks of plates and shapes are low, as these products are among the most widely used for defense applications, but we can meet most any requirements for *welded tubing* and for *straight chrome stainless.* And *sheets* are in fair supply, especially cold rolled, heavier than 19 gauge. Other products in good supply at Ryerson: *drill rod, tool steel, hydraulic tubing, structural tubing, Inland 4-Way Safety Plate.*

How about Ryerson service?

Our staff of experienced steel specialists is always at your service to give counsel on any steel problem. You may be surprised at what can be accomplished with their help. For example, we can often suggest practical alternates for steel that's not on hand. And if you always tell us what length or width you are actually using, we may sometimes be able to fill your order from smaller pieces when we could not handle it otherwise. Then too, we are continually adding to our service facilities; so you can depend on quick delivery of available steel.

What about the future?

With reasonable restraint on the part of steel users and conformance to government regulations during the strike, we should be able to take care of most essential requirements for some time. Upon resumption of steel production, we will replenish our stocks as rapidly as possible. Meanwhile, you may be sure we'll do our best to help whenever you call.

PRINCIPAL PRODUCTS

CARBON STEEL BARS — Hot rolled and cold finished

STRUCTURALS — Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS — Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

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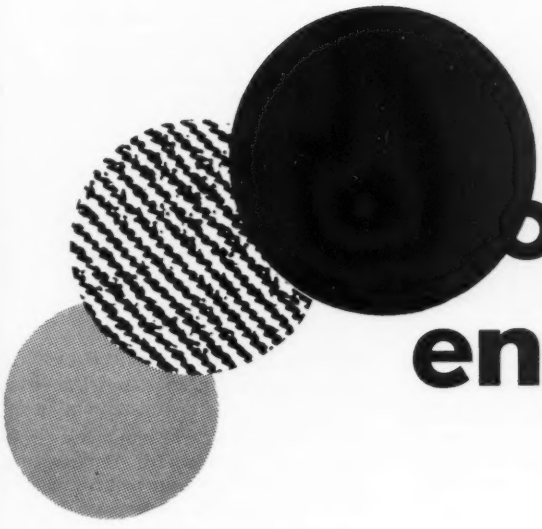
Phone: ANgelus 2-6141. From San Diego (No toll) Phone: ZEnith 6660.

SAN FRANCISCO PLANTS: Box 188, Emeryville. Plant: 65th & Hollis Sts. Phones: OLympic 3-2933, ENterprise 10176.

SEATTLE STEEL PLANT: Box 3268, Seattle 14, Wash. Plant: 1200 - 4th, South. Phone: Seneca 2300.

SPOKANE: (INLAND EMPIRE) PLANT: Box 2158, Spokane 10, Wash. Plant: North 207 Freya St., Spokane, Wash. Phone: Keystone 9311.



Color engineering...

what it can do for your plant

By JOHN C. WRIGHT, Color Consultant, Mill Valley, California

COLOR ENGINEERED INDUSTRY enjoys many advantages. Its personnel work faster and more efficiently, and with less danger. Fewer accidents and higher morale mean less absenteeism. Training is completed more quickly and easily, and men take pride in their surroundings, entering into the spirit of their work with enthusiasm.

This is not to say that color can compete with wages or other personal satisfactions as an incentive, but it cannot be denied that an environment pleasantly acceptable to the eye really pays. An industry that has experienced it will never be satisfied with anything less.

Painting and remodeling is a considerable expense, and if the wrong colors are used, conditions are worse than before. It might as well be done right . . . engineered!

IN DESIGNING COLOR for an industry, the first step is an inspection of all areas and processes. Color will naturally be most successful if incorporated in the architect's plans before building, and it should never be thought of as an adornment to be tacked on later.

The visual tasks must be thoroughly analyzed before colors are chosen, and it is important to control as many small details as possible. This, of course, takes time, and the cooperation of many people.

Once the functions are understood, colors are designed, leaving nothing to chance or whimsey, and finally the application of color is carefully supervised to insure that there is accurate matching. In spite of the fact that there might be more colors than in an ordinary, un-engineered job, careful instructions on a color schedule, along with wet paint samples, can considerably reduce time spent by painters.

Color is seen through contrasts, and first in importance is the contrast of value—differences of dark and light. Legibility depends upon value contrasts, an obvious example being this printed page.

Too much contrast is just as bad as not enough, and glare in working surroundings is one of the things a color engineer tries to avoid. Actually, the contrast between black type and white paper is much less than that between white paper in the sun and white paper in the shade.

Second in importance is contrast of hue—where we can tell a yellow from

a red, a blue from an orange, a green from a purple.

Third is the contrast of a color's intensity—ranging from the color in its pure hue all the way down to gray.

Today's familiar yellow and black highway signs are particularly effective because they employ all three contrasts to a strong degree, yellow being a color with its highest intensity at a high value, and black having a low value and zero intensity.

Colors that we perceive tend to stimulate us to some degree, and this stimulation, if strong enough or continuous enough, results in fatigue. That fatigue is counteracted by complements of the colors that fatigue us. Red fatigue is relieved by bluish green, for example.

Colors near to gray, or threshold grays, can be looked at for long periods of time without requiring much relief. Pastel colors are popular for this reason. The desired effect is to have enough stimulation to prevent boredom, but not enough to cause fatigue.

A Balanced Diet

There must be a balanced diet, and the length of time that a color is seen is a vital factor in the choice of that color. In areas we pass through quickly (such as a corridor), or where we spend little time (an anteroom or storage closet), more brilliant color can be used without danger of color fatigue.

There are occasions when a color should dominate all else—for example, use of color to warn of danger, or use of color to speed location of emergency equipment (such as fire fighting apparatus). Indiscriminate use of color, however, creates an unconscious confusion in a spectator's mind. That spectator is not unlike the small boy in a candy store, so dazzled by bright and pretty labels that he can't decide which one to select.

Color engineering attempts to place dominant colors where they will have a genuinely useful part in identifying important processes and subduing the relatively unimportant ones.

There are several illusions caused by color that can be put to use by the designer. Some colors give the appearance of being closer or advancing; others give the appearance of being farther away, or receding. In general, brilliant colors, especially in the neighborhood of red and orange, have the former characteristic, while pale, grayed colors (blue and violet in particular) have the latter.

Ceilings can be made to appear higher or lower, rooms larger or smaller, and space in general modified to some degree by judicious handling of these color characteristics.

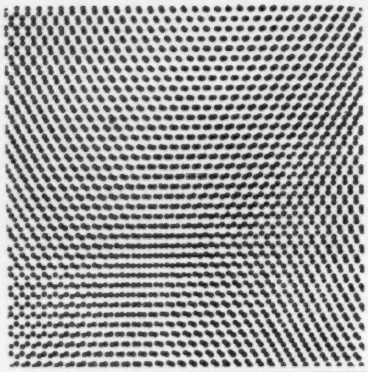
Objects will seem to weigh more than they actually do, if they are dark in color. On the other hand, light colored objects give the illusion of weighing less. This point might be exploited where heavy material must be lifted by hand.

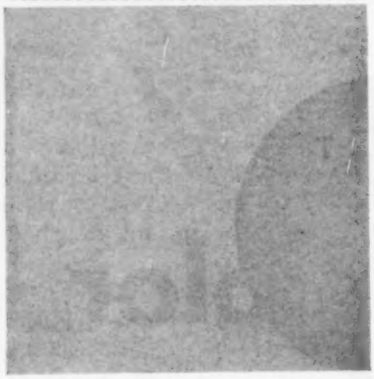
Another color illusion much publicized is the inherent temperature. Colors are described as warm or cool, and the general agreement is that warm hues are orange, red, and yellow; cool hues are blue, violet and blue-green. Rooms painted or decorated with those colors will generally give a corresponding sense of warmth or coolness to the persons who are in the room.

Tell the Whole Story

Paint for an industrial plant, however, is not the whole story. Floor coverings, wood paneling, textiles, plastic and composition surfaces, ceramic tile, and many other materials enter into it. Every surface, whether it be flat wall paint, brick, or even grass, has a color and should be included in the total effect.

Where material is being tooled or machined, first of all the machine is differentiated from the material, then different parts of the machine are given contrasting colors, the degree of contrast and type of contrast determined by the function. An emergency shut-off switch, for example, must contrast sharply. Glare is eliminated, and finally backgrounds are designed as relief from necessary contrasts, as illuminating surfaces, etc.





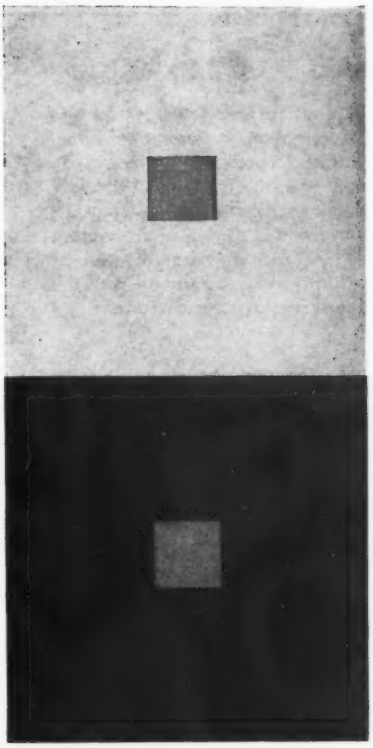
CONTRAST through TEXTURE

Top surface is stimulating, bottom is restful. Shift your eyes back and forth and feel the difference. This is good demonstration of texture value.

You'll want to use color . . .

But just because you use color, it may not be the complete answer. Yellow, for example, is excellent for a safety measure in the marking of truck lanes on your floors. Personnel working near those lines, however, may become distracted and your production could suffer—unless the use of color in your plant is properly engineered on an individual basis so that the distracting influence is counteracted.

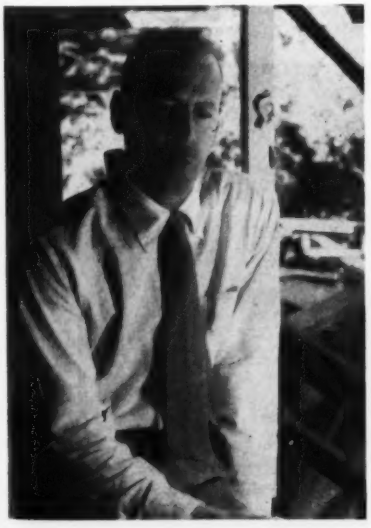
ILLUSION through COLOR



Which center spot is the darker? Ans.: both are the same. This shows value of color illusion by different combinations of color tone that are engineered.

There are no hard and fast rules to follow as each situation calls for its own solution. If aluminum, for example, is being shaped, one solution might be to mark danger areas with red and other parts of the machine with a green-gray of a different value from the aluminum. This would create a need for relief colors, which an orange-gray floor and light blue walls would satisfy.

John C. Wright, Author
Color Consultant



But other problems might be present. If by necessity the temperature of the area was chilly, warm hued walls would be more effective. One problem must be integrated with another, and compromises made.

Look Out!

Secondary effects must be analyzed. A traffic lane for trucks, marked with yellow, might be effective as a safety measure, but might be distracting to personnel forced to work close by. Because of complexities such as these, each solution is tailor-made.

Storage of material is handled more effectively by color labeling, and subclassifications formed within major groups by using families of colors. For example, small metal parts of a certain category are labeled with blue, and different sizes within the same category by variations of the same blue. A simple, obvious color code will greatly simplify locating and sorting, and will cut down the time spent orienting new employees.

People enjoy the sensation of space, and the removal of all shadows by diffuse illumination is in my opinion a harmful practice. With the use of soft shadows, advancing and receding colors, and value contrasts, space becomes accentuated and life a little more exciting visually.

In the large department stores one often experiences this lack of space, where the management has so skillfully produced uniform illumination that the result is flat and depressing. People like to be aware of themselves as objects moving about in space. The contrast between solid and void, dark and light in addition to being pleasurable, helps create traffic patterns. We unconsciously move through voids, avoiding "solids."

As far as safety colors are concerned, the American Standards Association has approved various color specifications for accident prevention and identifying equipment. These colors are based on shock value and color conditioning, and are of long proved effectiveness. Color engineering uses these established color symbols, insuring the fact that they are not rendered ineffective by the wrong backgrounds, etc.

If, for example, yellow, the color designating caution, is used where there is lots of other yellow around, it will have no shock effect, and must be reinforced with a background of suitable shape and color, and the yellow itself can be modified toward green or orange to differentiate it from the other yellows. With fluorescent lacquers on the market, more brilliant colors are available and should be used for this emergency use.

In offices, reception rooms and related areas, color engineering employs the same principles used in shop areas. Inasmuch as the tasks here are chiefly paper work and verbal conferences, there is more leeway with color.

Men with private offices have a chance to satisfy their own particular fancies, and a consultation with the color specialist helps them find out how best to do it. General offices can be either dreary rooms emphasizing the monotony of the work, or visually

COLOR can work MIRACLES IN YOUR PLANT

Ceilings can be made to appear higher or lower. Rooms can be made to appear larger or smaller. Objects can seem to have more or less weight. Temperatures can be sensed as higher or lower. Dispositions of personnel can be improved or wrecked.

THE SHADE OF THINGS TO COME

Probability is that future offices will be equipped with a flexible system of illumination, colored and white, which will be manipulated according to daily energy cycles. One sees offices now and then with brilliantly colored walls—fine for the visitor but eventually tiring for the stenographer who sits there eight hours a day, week after week. Flexibility and manipulation of the lighting technique, effectively combined with the color design, go a long way toward perking up your secretary and keeping your visitors in good mood.

exciting, cheerful places where the clock is seldom watched.

It is probable that in the future most offices will be equipped with a flexible system of illumination, colored and white, which will be manipulated according to daily emergency cycles. One sees offices now and then with brilliantly colored walls . . . fine for the visitor, but eventually tiring for the stenographer who sits there eight hours a day, every day. There is usually plenty of incidental brilliant color in any office, in the women's clothes and other miscellaneous objects, including executives' neckties.

And so, all through an industry's buildings, color is used through the application of a few, basic principles. In lounges and restrooms color can help bring a psychological change as well as a physical change from work areas; in cafeterias and restaurants it can enhance food and help digestion, and in employment offices it can put at ease the hopeful jobseeker.

Look to the Future

In the field of product design and packaging, the color engineer works in cooperation with the sales manager, finding out which colors from past experience have sales appeal. With this knowledge and an awareness of trends he can create new colors and re-use already successful ones.

He is a detective who discovers why a color is successful, and he applies the principles to other colors. Mere reliance on past success with color, with no research into psychology, will mean being always a step behind the market, whereas it is best to be one step ahead . . . just *one*. Being too far ahead is dangerous, since good, logical design alone doesn't always sell.

Colored Viewpoints

An industry should, through color and the other elements of visual design, have its own unique flavor . . . a distinctive means of identification which stamps it as modern, efficient and well integrated, and which suggests the function of the industry, whether it be nuts and bolts, rubber hose or frozen fruit.

This identifying "look" can be included in everything from stationery to trucks, and will be effective not only from the viewpoint of public relations, but also within the industry, where it will instill a sense of pride and coordination.

Toothless saw with a sharp bite

THIS TOOTHLESS saw is cheaper, lasts longer, is safer, and seems to saw faster than the standard type band saw when it is used on stainless steel and high alloy steels.

It will reduce industrial accidents, save vast sums of money spent on expensive saw blades, and reduce the use of strategic metals used in making saw blades, according to Solar Aircraft Co., San Diego, where the idea was developed.

In this case, the blade is ordinary steel box strapping. It was developed by Jack Prince, methods analyst, in an effort to cut down Solar's saw blade cost.

One reason why conventional saw blades have shorter life is that they break at points where teeth have been cut. The steel strapping, with no teeth, eliminates this problem.

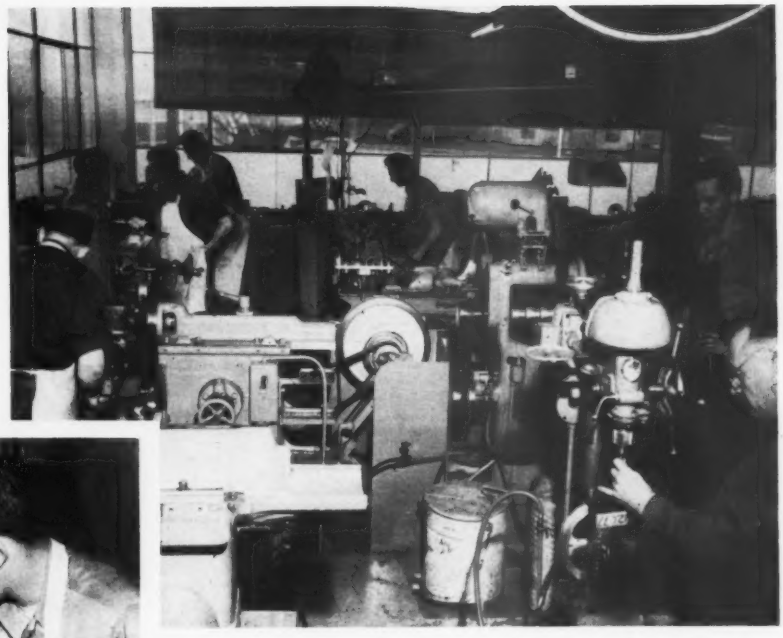
Ordinary strapping has been found to last 29 hours of use.

BEFORE

Band saw blades used up each month at Solar cost about $2,500 to replace.

AFTER

Ordinary steel box strapping material shows that it can cut just as well.



SULAK Manufacturing Co., Seattle, employs 90 persons on subcontracting for Boeing of small assemblies and machined parts. Many small firms miss out for lack of heat-treating facilities like this oven.

If you are still in the market for

AIRCRAFT SUBCONTRACTING . . .

The requirements may seem exasperating and prospects uncertain, but the jobs can be well worthwhile for the persevering vendors

HAVE you looked for a subcontract lately? If not, you might try.

Everyone will be for you. From the Small Defense Plants Administration to the prime contractors themselves, they're beating their breasts. "More business for small business!" is the patriotic cry.

The plush carpets have appropriately been rolled out. When the little fellows come running, however, the rug is sometimes unceremoniously yanked. . . .

This is a disheartening experience, naturally. After it happens, the owner of the small firm looks back in the small print and finds a little phrase like, "Furnishing of a product not in compliance with requirements may be sufficient cause for removing the product and manufacturer's name from the approved list."

One enforcement of a clause like that is about enough to sour anybody on this subcontracting business. It has been enough to keep more than one small firm from coming back for a second subcontract.

There is, however, plenty of gold to be extracted from the shifting sands of subcontracting. The little fellow who is patient enough to prospect intelligently can make it pan out well.

Much Misunderstanding

Unfortunately there has been a great gap of misunderstanding between prime contractor and would-be subcontractor. In this gap the garden-variety manufacturer often has failed to realize that the making of jet bombers, for example, is a different business from—say—building aluminum window sashes. Today's military aircraft —those big, swept-wing, multi-engined monsters that roar across the sky in nothing flat—are unquestionably the most complicated mechanisms ever constructed by man.

Parts of them are built to almost fanatically close tolerances. Materials that go into them are inspected dozens of times. Fabrication procedures are followed that seem ridiculous to ordinary industry—but woe to him who deviates!

These apparent fetishisms are not, however, whims of the aircraft manufacturers. Ninety-nine times out of 100 they are fully justified; always they are dictated either directly or indirectly by the Air Materiel Command. So there is nothing you can do about them. If you want subcontracts you make up your mind that it takes blind obedience to the requirements.

The prime contractors themselves have grown up with these hard-to-meet specifications. Long years of habit have made them impatient—to

IT TAKES little plants to feed big ones. Spacers, bolts and bushings are turned out for Boeing by Seattle Screw Products.

show the other side of the coin—with people who don't readily accede to these difficult demands. If they could, the prime contractors would skip subcontracting and do the work themselves, gladly—just to avoid the burden of "educating" the small manufacturer into new and exacting methods.

Work Spreads Out

But the defense effort is now so big there is no choice: subcontracting is the only solution, and Uncle Sam has told the big fellows they might as well go along with it. The magnitude of their co-operation is sometimes surprising, too. Boeing Airplane Company in Seattle, for example, places work with more than 2,000 manufacturers and suppliers. Well over half of these firms are small businesses—that is, they employ less than 500 people. At Boeing more than 40 per cent of the Air Force dollars received are diverted to subcontractors. Another 25 per cent goes to materials and parts suppliers. Since Boeing is right at the top in defense orders, with a bigger backlog than any other aircraft manufacturer, it is obvious that subcontracting is pretty "big" small business.

Tell Your Story

How, then, does the little fellow go after it?

First of all, he should get in touch with the prime contractors—by correspondence, preferably — telling in detail what equipment he has, what kind of work he has been doing, how large is his working force, and what he feels he can produce that the prime contractor needs.

Boeing follows a policy of sending a representative to check on the facilities and other assets of the small plant. Does it have the proper precision measuring instruments, accurate surface plates, and gauges of various kinds? Has it proper facilities for inspection, heat treatment, magnaflux, anodizing or plating? All these may be required.

If the small firm lacks some of them, its owner will have to make a decision. Assuming that Boeing—or whatever prime contractor is involved—is willing to place on order, will it pay the small firm to buy what is needed in additional facilities, install them, possibly enlarge his plant, and train additional personnel? Maybe the work the prime contractor offers won't justify this trouble and expense.

At this point the small manufacturer can go to the nearest office of the Small Defense Plants Administration, lay his cards on the table, and make application for a loan from the Reconstruction Finance Corporation. The fact that he has a prime contractor asking for his services will weigh heavily in his favor.

This is to be remembered, however, even with a certificate of necessity, the small manufacturing firm cannot amortize capital assets such as these in less than five years. And then there's this risk: the prime contractor is in no position to assure a steady supply of work. He can't even guarantee that a contract for supplying any particular part will not be cancelled due to design or procurement changes.

Let us suppose, however, that a small firm has cleared all these hurdles and comes sailing home with an apparently healthy, lucrative contract. Work begins. All seems well. But let's not kid ourselves.

Don't Kid Yourself

Actually, all may NOT be well. Let us suppose something unpleasant—that the small firm has carelessly assumed it can apply ordinary procedures to aircraft parts. In this frame of mind, it believes the parts it is manufacturing are perfect. But they're not.

They're shipped to the prime contractor and they immediately undergo a rigid inspection—from which they

Service to our readers

SUBCONTRACTING FOR AIRCRAFT was also thoroughly discussed in an article "How To Get Aircraft Subcontracts" which appeared in the February, 1951, issue of *Western Industry*. It was a symposium of information from all of the Pacific Coast aircraft builders, showing how vendors should submit information on their facilities to make it easy for prime contractors to do business with them.

bounce back like a rubber ball. They're rejected: not up to requirements. This happens repeatedly.

The moral is this: the management of the small firm should go to the greatest pains to understand every last fillet and radius of the part it has subcontracted to build. If there is any question at all about anything, the small firm should get in touch with the prime contractor at once and iron things out.

Personal Visit Helps

Correspondence usually is not much good in settling such matters. Even telephone calls may not help. But a personal visit to the plant of the prime contractor is certain to straighten matters out. Such a visit, indeed, may be the key that will unlock a highly-profitable future for the small firm. A tour through the big fellow's plant, and conferences with his engineers, foremen — even workmen — may be worth ten times the cost of the visit.

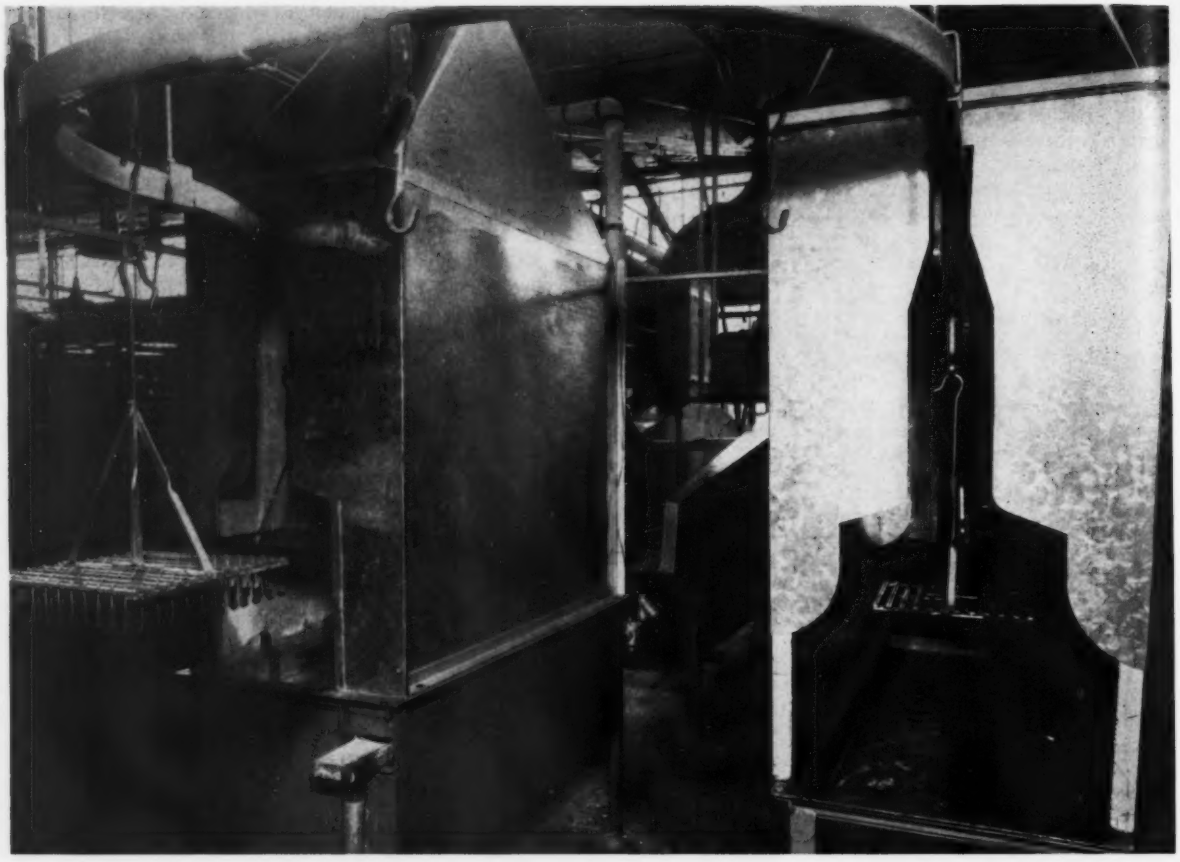
Avoid Arguments

There is one big DON'T for the subcontractor to remember — don't argue over requirements and tolerances with the prime contractor. Give him full credit for knowing what he wants, and be certain you give it to him. He can remember too many material failures that were traceable to laxity in tolerances to have any patience with arguments against them. You may think his high standards are senseless—and maybe they would be, if he were building house trailers. But he knows his product won't be accepted by the government inspectors unless he adheres strictly to every last specification.

If you're going to share the big fellow's business, you'll have to share his grief, too. But with materials as hard to get nowadays as they are, subcontracting is one sure way to keep your plant busy. And with the international situation what it is, subcontracting is apt to become more attractive than ever.

HAROLD HEATH (left) who has a four-man plant in Seattle is visited by a representative from Boeing, gets a subcontract to fabricate fittings.

PLASTIC DUCTS once were made by themselves, now are sub-contracted out to Pacific Plastics Company of Seattle.



Friden Calculating Machine Co., Inc., San Leandro, is home for one of the first production line applications of solid film lubricant. (Left) hot water rinse unit, (center) chemical dip tank producing etched surface on parts, (right) solid film lube tank.

BUILT-IN LUBRICATION

for sliding parts

Production line application of solid film lubricant is good for the life of these parts

IN WHAT IS BELIEVED to be the first production line application of electrofilm solid film lubricant, the Friden Calculating Machine Co., Inc., in San Leandro, Calif., is now treating up to 2,000 parts an hour by Electrofilm Graphite process.

This process (formulated by the Electrofilm Corporation, 7116 Laurel Canyon, North Hollywood) was adapted for a 75-ft. production line in the Friden plating department several months ago. Solid film lubricant has now replaced liquid lubrication for dozens of different calculator parts, including division aligning sensing fingers, selection gear shafts, add-subtract gear shafts, multipliersetting levers and others requiring permanent lubrication.

Chief advantages of the process are these: (1) parts are given rustproofing

By

FRED SHEAR

Supervisor
Plating Department
Friden Calculating
Machine Co., Inc.
San Leandro
California

characteristics, (2) permanent lubrication is provided for every treated part, and (3) lubrication is retained regardless of temperature changes in the calculator.

Impervious to Climate

This last point is particularly important, since Friden fully-automatic calculators are used in every part of the world and in every type of climate. Oil lubricants formerly used were apt to run out of calculating machines in hot climates and become so thick in cold weather that the machines did not operate smoothly. The high temperature resistance of solid film lubricant makes calculator parts virtually impervious to climatic conditions and changes.

The possibility of using a solid film lubricant was first suggested by Roy Renholts, Friden production manager, and the company's metallurgical staff conducted preliminary research.

New Graphite Method

It was known, of course, that the use of graphite was not a new idea. It has been used extensively, but it lost favor with the advent of highly loaded bearings and high rotating speeds of modern engines and machinery.

Although many graphite applications had ably demonstrated their value for lubrication and other purposes, they were abandoned because of the difficulty of obtaining a permanent film and because of the manner in which graphite, suspended in lubricating oils, is removed by centrifugal force.

Research Conducted

Research revealed, however, that the Electrofilm Graphite process provided a means of applying a full graphite film on the desired surface only, with a high degree of adhesion. This allowed practical use of the highly desirable characteristics of graphite, and, following a number of experiments and a thorough study of results, it was decided to use the electrofilm process.

Tailored Production Line

Drawings for the production line were made up by our plating department, with each unit designed especially for use in the new process. The production line, built and laid out without a single change being necessary in our plans, has operated perfectly from the start.

The entire set-up is conveyorized, with parts automatically carried through every step. The 50 racks, some holding as many as 144 parts, are conveyed over the 75-ft. route at the rate of one ft. per min.

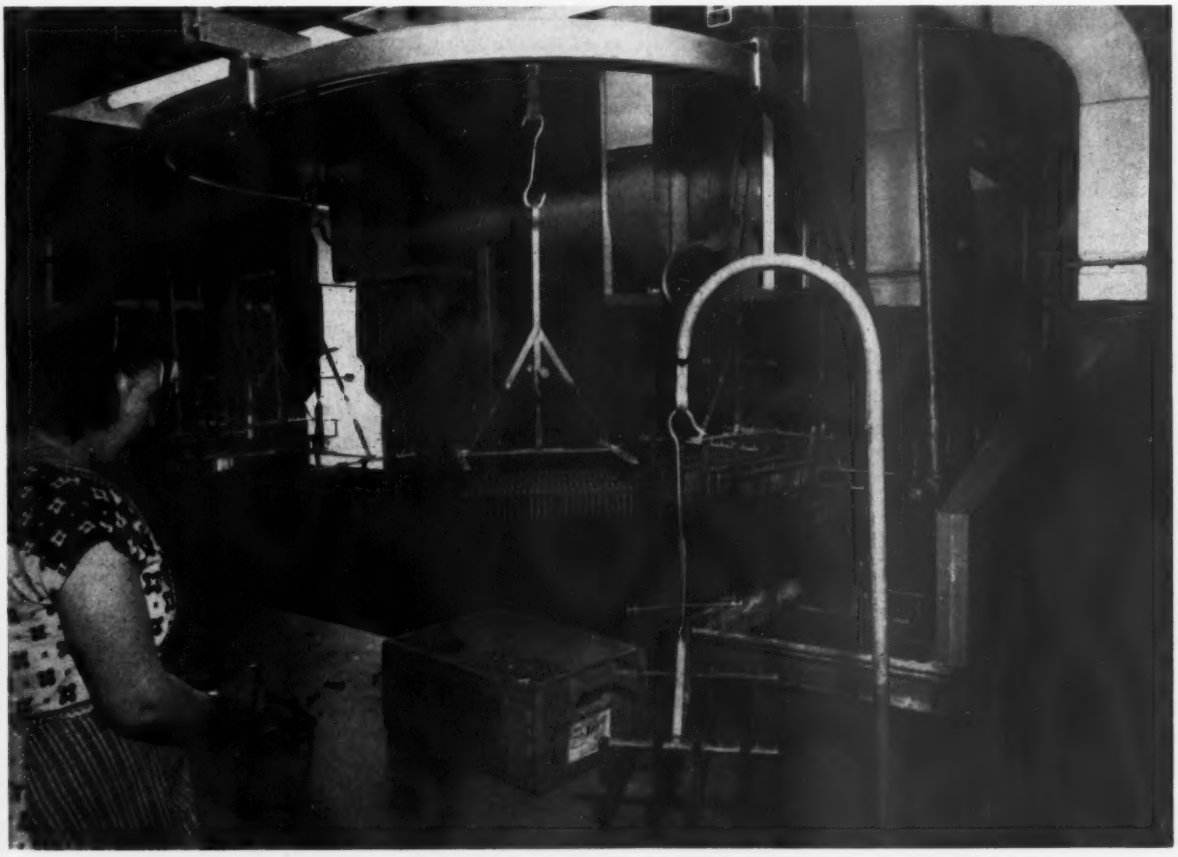
Rust-Proofing

The process begins with a chemical dip (Parco-Lubrite, manufactured by Parker Rust Proof Company, Detroit) which creates an etched surface on each part and also gives its rust-resistant qualities. This rust-proofing is important, since it retards rust in Friden fully-automatic calculators used in extreme climates.

Parts then pass through a hot water rinse and are dried off under a hot air drier. The rinse is heated by water coil, with an automatic control to keep the water at a temperature of approximately 190 deg.

The third stop is the solid film lubricant tank. As parts are carried through the mixture, the liquid is continually agitated and also cooled by water coil to insure an even, blister-proof coat-

A FEW OF THE RACKS are conveyed into chemical dip tank, as detent shafts begin their trip through electro-film production line. Most units in the line are made of steel, but chemical dip tank is monel. Solutions are used average of three months before changing.



INFRA-RED tunnel is given final test as production line is set up by maintenance crew. Tunnel, as well as other line components, was designed by Friden engineers.

ing. Since the material tends to flake off if the coating is too thick or not applied evenly, particular care is taken in applying the solid film lubricant.

When properly used, the solid film lubricant with its graphite properties (the formulation of the compound is secret, but includes natural graphite, selected resins and various other metals and their salts, according to Electrofilm Corporation) enters into the little valleys created by the chemical dip, covering the entire etched surface of each part and increasing the dimensions of the parts only a few tenths in a thousand.

Evaporation and oxidation in an infra-red oven designed by Friden engineers follows. The lubricant is baked on, completing the process.

Solid Film Advantages

Electrofilm solid film lubricant, once baked on, is not destroyed by ordinary production processes. Another advantage is that it increases the dimensions of a part only 0.00015 in. to 0.0005 in. in thickness.

It should not be confused with other graphite solutions or electro-deposited graphite or carbon. In many cases, lubrication engineers encountered difficulties in using the so-called "colloidal" and natural types of graphite. Consequently, there were many instances where graphite in itself did not prove beneficial. The process now in use at the Friden plant has no relation to these earlier graphite applications.

An important benefit of the process is that solid film lubricant is particularly adapted to sliding surfaces, which are characteristic of many Friden parts. Use of the new lubricant has greatly reduced the friction between these parts in addition to increasing resistance of the parts to wear and reducing abrasion. In fact, friction only makes the dry lubricant more secure. Lubrication is furnished until the metal is at last worn down below the etched surface.

It is unlikely that a part would ever see that much use. By the time the etched surface would be completely worn away, the part would have seen several times its normal lifetime of use.

TITANIUM to be used in commercial airliner

SUBSTITUTION of titanium for aluminum alloy and stainless steel in a soon-to-be-constructed commercial airliner, will reduce weight of the liner by about 200 lb., according to an announcement by Douglas Aircraft Co., Inc., Santa Monica, Calif.

Industry's wonder metal, titanium, will be utilized in commercial airline construction for the first time early next year when Douglas builds its DC-7 super transport.

About 88% of the "skin" on the engine nacelles will consist of titanium sheet. Areas in which titanium will be used include the structural covering of the aft nacelles, some frames and the landing gear doors. Unalloyed titanium will be substituted for stainless steel currently used for firewall webs.

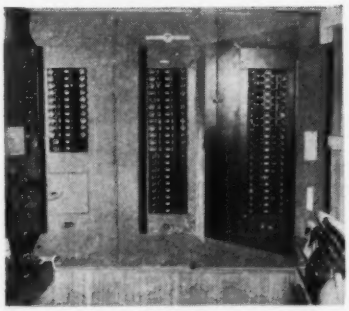
Main reason for this materal substitution is that titanium, which has the strength of steel, weighs about 56% as much. For example, on the two outboard nacelles of the DC-7, an area of 11,800 sq. in. of .025 guage titanium will weigh only 64 lb. This compares with the 68-lb. weight of the 8,000 sq. in. of stainless steel in comparable nacelles of a DC-6B. Inboard nacelles of the new airliner will have 11,300 sq. in. of titanium, weighing 64 lb. On the DC-6B, the 7,600 sq. in. of stainless steel weigh approximately the same.

In addition to its light weight, titanium, in many applications, has heat-resistant qualities superior to those of stainless steel.

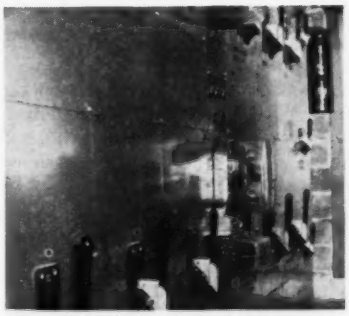
REVERE COPPER
IN TWO GREAT SEATTLE PROJECTS

Northgate Project, suburban shopping center, seen from the air

Air view of University of Washington's Health Sciences Building



Switch and fuse type lighting panelboard for control and protection of lighting circuits in another Northgate store



Main switchboard in a Northgate store

Large electrical loads are required to serve these two Seattle projects. To carry heavy currents safely and with minimum voltage loss, prefabricated Flex-A-Power distribution systems, with copper bus bars made by Revere, were installed, plus protective circuit breaker switchboards, control centers and lighting panelboards. Revere Copper, Brass and Bronze are used in these products. Flexible distribution systems and protective control equipment were furnished by Trumbull Electric, Department of General Electric Company, Plainville, Connecticut, and Seattle, Washington.

The two projects consist of the University of Washington's Health Sciences Building, dedicated in 1949, housing the schools of medicine, dentistry, and nursing; and the Northgate Project, world's largest shopping center, containing 78 stores plus 50 medical offices, a hospital, a theater, covering 26 city blocks. In the generation and use of electricity copper is preferred, because it has the highest electrical conductivity of all the commercial metals. Revere is proud to have supplied copper for these two large projects, and to many others the country over.

REVERE

COPPER AND BRASS INCORPORATED

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PACKAGING—MATERIALS HANDLING INSTITUTE AND SHOW

Concurrent events scheduled in Los Angeles: Exhibits open from August 12 to 14, Meetings August 13 and 14

PACKAGING and materials handling will be a focal point of interest for industry in Los Angeles August 12-14, with two concurrent events, the Fourth Western Packaging and Materials Handling Exposition and the Second Biennial Packaging and Materials Handling Institute.

The former will be staged in the Shrine Convention Hall Aug. 12-14. The latter will consist of two morning sessions, August 13 and 14, in Room 133, Founders Hall, University of Southern California. The Hall is at the corner of 34th St. and University Ave.

Nearly 150 exhibitors had contracted for space by the middle of June, and it was expected the total would increase before the show opened. The exhibit space will occupy the entire ground floor of the Shrine Convention Hall and the mezzanine which completely surrounds it.

There will also be an outdoor exhibit space, making possible for the first time the actual demonstration of heavy mobile materials handling equipment which is becoming of increasing importance.

The Exposition itself is designed to demonstrate all type of packaging operations from the designing and engineering stages through each movement to the final completion of its mission. Likewise, it will delineate the problems of moving, storing, shipping and general handling of various types of materials, commodities and plant processing.

A number of new types of packaging machines, only recently in commercial production, will be features of the Exposition. One of these, which achieves vacuum packing in plastic bags, has been specially constructed with plastic chambers so the actual vacuum packing process may be observed. Other new equipment is designed to solve the peculiar problems of California's rapidly expanding date and fresh vegetable industries.

According to Fred Todt, President of the Western Packaging Association, "A great many of our Western packaging problems have proved so different than those of the rest of the country that we have had to forget the generally accepted standard methods and develop completely new ones. In many cases we have created completely unorthodox methods of packaging and handling our products for market. You will find many packaging operations in the West which have never yet been thought of in the East. Hence, we always have the interest of experimental processes in our Western packaging industry."

The show is being directed by the New York exposition management firm of Clapp and Poliak, who had charge of the previous three shows held in San Francisco.

About the Institute

The Institute is sponsored by the Industrial Engineering Department and the Extension Division of the University of Southern California, with the cooperation of the Industrial Engineering Division of the Southern California Section, American Society of

Continued on page 42

Preliminary Program

WEDNESDAY, AUGUST 13, 1952

Chairman: E. P. TROEGER, Supervisor of Process Engineering, Douglas Aircraft Company, Inc., Santa Monica Division

8:30-9:30 REGISTRATION AND MOTION PICTURE

Films showing various aspects of military packaging will be shown.

9:30-9:40 WELCOME

DR. GEORGE A. HARNESS, Chairman, Administrative Committee, School of Engineering, University of Southern California.

9:40-11:00 PANEL—MILITARY PACKAGING

a. *The Military View of Current Los Angeles Area Packaging Problems*

Speaker: RAY PASS, Chief Packaging Section, Quality Control Directorate, Western Air Procurement District, Air Materiel Command, U.S.A.F., Los Angeles.

Mr. Pass will point out the packaging difficulties often encountered by Air Force contractors and sub-contractors in the Los Angeles area. He will suggest some method of avoiding and eliminating these difficulties.

b. *What to Consider About Packaging When Bidding a Government Contract*

Speaker: RALPH C. BUTLER, General Manager, Aircraft and Export Packaging Division, Lyon Van & Storage Company.

Mr. Butler will discuss the hidden pitfalls in interpretation of packaging specifications when bidding a contract.

c. *Packaging From a Manufacturer's Standpoint*

Speaker: J. D. NUNN, Manager, Shipping Department, Lockheed Aircraft Corporation.

Mr. Nunn will indicate how to handle packaging after a contract has been received.

d. *Discussion*

11:00-11:15 RECESS

11:15-12:00 CURRENT TRENDS IN MILITARY PACKAGING

The speaker had not been definitely arranged for at this writing, although it had been hoped to secure Colonel Rudolph Fink, Chief, Packaging Section, Air Materiel Command, U.S.A.F. Wright Patterson Air Force Base, Ohio.

Subject will be packaging from the armed services point of view.

Discussion.

12:00 ADJOURN

(For Thursday's program, see page 42)

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol Vistac Oil

UNIT Rock drill-Ingersoll-Rand drifter

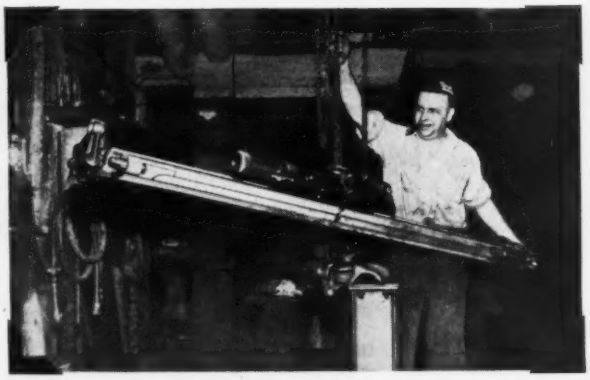
LUBRICATOR Line oiler

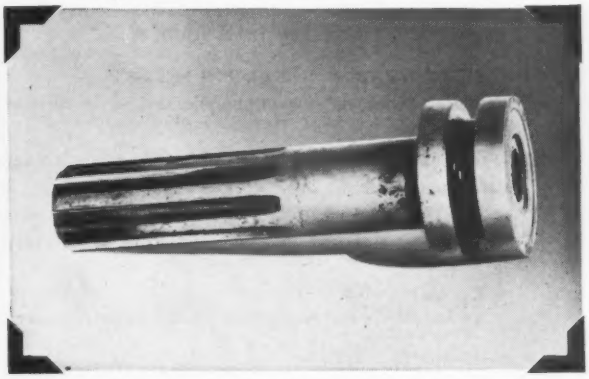
OPERATION Deep underground mining

CONDITIONS High humidity & temp.

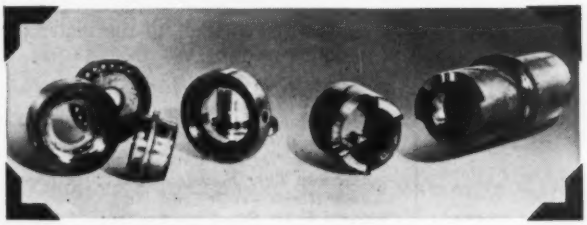
FIRM Sunshine Mining Co., Kellogg, Idaho

Only 0.001 wear on rock-drill piston in 120 shifts!





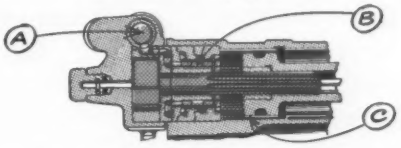
ON THE 3100-FOOT LEVEL of the famous Sunshine silver mine, this drifter, lubricated with Calol Vistac Oil, was in steady service for more than two months before coming in for service. When disassembled by "Drill Doctor" Dave Farnsworth, the piston "miked" only 0.001 inch wear despite the tough conditions in which the drill works. Working face is 400 feet below sea-level. Humidity is around 90 with atmosphere at a constant 75°F. After cleaning, the piston and other parts were put back in service.



VALVE-CHEST ASSEMBLY, chuck and chuck jaw from the drifter. Note the absence of lacquer or corrosion on air-valve parts. Because Calol Vistac Oil has held air-tool wear to the minimum and is approved by the miners, Sunshine Mining Co. has used it for more than 10 years.

REMARKS: Besides providing good air-tool lubrication without excessive vapor or bad odor, Calol Vistac Oil is excellent for heavy-duty plain bearings, reduction gears, motor gear heads, etc. It comes in several grades and may be applied by wick-, ring-, and drip-feed oilers.

How CALOL Vistac Oil cuts costs in air-tool equipment



A. Atomizes quickly and completely—carries evenly over all parts. Does not fog excessively and has no unpleasant odor.

B. Additives help form tenacious, oily, pressure-resistant film in wet or dry conditions—cuts wear and power loss. Small quantity lubricates efficiently.

C. Resists high temperatures and oxidation. Stays fluid at low temperatures.

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STANDARD OIL COMPANY OF CALIFORNIA

Three key figures in coming events at Los Angeles

JOHN R. HUFFMAN
University of Southern California, in charge of institute program

C. A. BOGENRIEF
of Grayson Controls, discusses establishment of work standards

FRED TODT
President of Western Packaging Assn., says the West has its own problems

THURSDAY, AUGUST 14, 1952

Chairman: A. MAZZOLA, Chairman, Materials Handling Division, Los Angeles Section, A. S. M. E.

8:30-9:30 REGISTRATION AND MOTION PICTURE

"Materials Handling," a color film prepared by the General Electric Company which illustrates most types of handling equipment.

9:30-11:00 PANEL—TECHNIQUES FOR SOLVING MATERIALS HANDLING PROBLEMS

a. *Selecting the Right Type of Handling Equipment*

Speaker: C. O. BURGIN, Burgin Associates, Inc., San Francisco.

Mr. Burgin will correlate handling problem characteristics and the types of equipment they indicate as solutions.

b. *The Quantitative Flow Chart*

Speaker: LOUIS DE VILLENEUVE, Manufacturing Engineer, Lockheed Aircraft Corporation.

Mr. de Villeneuve will demonstrate a technique for locating machines and departments to minimize handling in a job-lot shop.

c. *Establishing Work Standards on Materials Handling by Ratio-Delay*

Speaker: C. A. BOGENRIEF, Chief Industrial Engineer, Grayson Controls Division, Robertshaw-Fulton Controls Company.

Mr. Bogenrief will illustrate the use of "occurrence" type studies to estimate the number of materials handlers required in a plant.

d. *Analyzing a Handling Problem with the Time-Lapse Camera*

Speaker: A. J. ROWE, Assistant Professor of Industrial Engineering, University of Southern California.

Mr. Rowe will demonstrate the techniques and procedures used to analyze a multi-man handling problem with a special camera that uses two feet of film per minute.

e. *Discussion*

11:00-11:15 RECESS

11:15-12:00 WORKSHOP SESSIONS (CONCURRENTLY)

a. *The Transition from Mobile to Conveyorized Handling*

Speaker: R. H. EDGECUMBE, Chief Industrial Engineer, Virtue Brothers Manufacturing Company.

This case problem and the ensuing discussion will be of interest to those concerned with floor conveyors and the movement of materials between widely separated work-stations.

Chairman: Dr. L. R. Guild, University of Southern California.

b. *An Integrated System for Handling Heavy, Bulky Items*

Speaker: J. E. OWENS, Supervisor of Plant Engineering, Douglas Aircraft Company, Inc., El Segundo Division.

This problem and the ensuing discussion will be of interest to those with problems which might be solved by an overhead crane or monorail system.

Chairman: A. J. Rowe, University of Southern California.

c. *To Be Announced*—This session will deal with a handling problem involving mobile equipment.

Open discussion after the scheduled problem has been discussed.

Further workshop sessions may be added if comments, suggestions and attendance indicate such a necessity.

Mechanical Engineers, the Los Angeles Chamber of Commerce, the Society for the Advancement of Management, and *Western Industry*. John R. Huffman, Associate Professor of Industrial Engineering, USC, will be in charge.

Reducing the packaging difficulties encountered by many in the Southern California area, particularly sub-contractors and those dealing with the armed service for the first time, is the aim of the first morning session. The second morning session is for the purpose of helping industry with its handling problems by providing them with specific techniques to use.

It will be on a workshop basis. Attendance at the Institute is open to anyone with an interest in the area of military packaging and materials handling. Registration fee is $7.50 for the two mornings, or $4 for one morning only. A company may register once and send one man to the packaging session and another to the materials handling meeting.

Acme Steel Company
Aerol Co., Inc.
Air Mac, Inc.
Allegheny Steel Band Co.
American Partition Corporation
American Type Founders Sales Corporation
Ames Harris Neville Co.
André Paper Box Company
The Arabol Manufacturing Co.
Archer Label Company
Automatic Web Control Mfg. Company
Avery Adhesive Label Corp.
Barrett-Cravens Company
Bemis Bro. Bag Co.
Better Packages, Incorporated
Big Joe Manufacturing Company
W. T. Billard, Inc.
Biner-Ellison Machinery Company
The Buda Company
L. H. Butcher Company
Peter D. Bowley and Associates
Bronco Rubber Products Company
Cargo Packers Incorporated
Ralph Chaffee & Company
Clark Equipment Company
Codie-Kay Co., Inc.
Continental Can Company, Inc.
Coseco
Cost Reduction Equipment Co.
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Continued on page 46

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***Eliminates Resharpening and Resetting*—it's cheaper to replace long-lived Claw Tooth blades than to use blades which must be resharpened a number of times during their life.**

***Increases Production*— more output per machine and manhour because of faster cutting and elimination of blade removal for resharpening.**

***Cuts Costs*—higher production and elimination of blade maintenance labor and equipment means lower bandsawing costs.**

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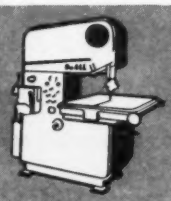
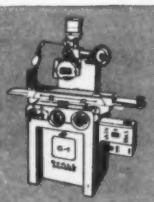


BAND MACHINES

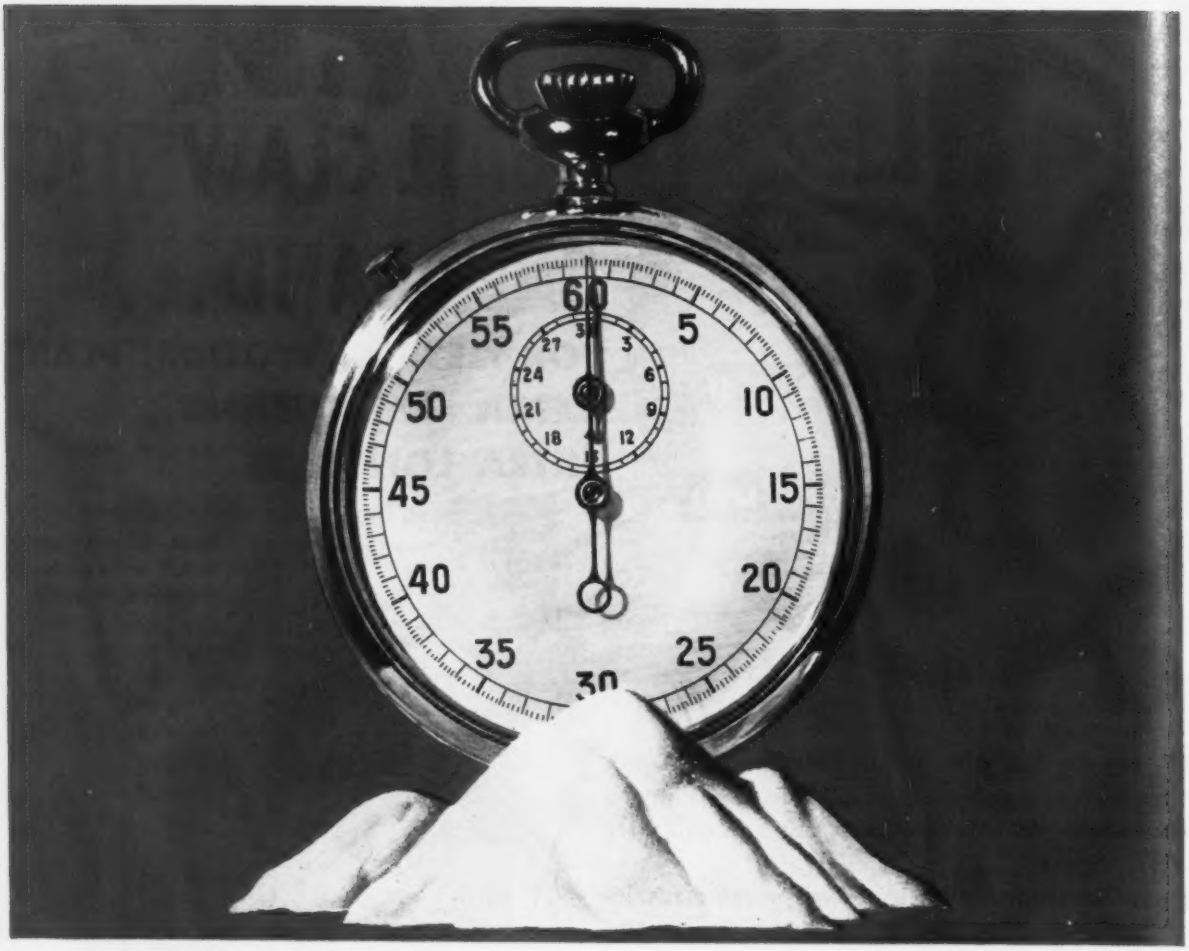


SURFACE GRINDERS

GAGE BLOCKS

GAGING EQUIPMENT

MOBILE INSPECTION UNITS



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Technical improvement in

PRINTED ELECTRONIC CIRCUITS

CLOSE-UP VIEWS of printed electronic circuits, before and after the eyelets are stamped at the conductor terminals. AiResearch Manufacturing Company, Phoenix, Ariz., is a late comer to this field.

A METHOD of fabricating better printed circuits—for electronic temperature regulators, analog computers, etc.—has been developed by AiResearch Manufacturing Company of (Phoenix) Arizona. Circuits thus produced are said to be superior because they comprise pure copper conductors, whereas conventional printed circuits have copper powders dispersed in insulating organic adhesives for use as conductors.

Initial step in making one of the AiResearch circuits consists of adhering a thin copper sheet to a phenolic plastic plate. Next, a conductor pattern is reproduced on the copper sheet by processing acid-resistant paint through a silk-screen stencil.

When the paint is dry, the plastic-copper assembly is immersed in an acid bath so that all parts of the copper not protected by paint will be removed. Then the assembly is rinsed in cold water and dried.

Holes are drilled through terminal points in the copper conductor pattern remaining on the plastic plate. Then copper eyelets are stamped in the holes to help maintain the alignment of the conductors and to facilitate the assembly of parts such as vacuum tubes with the circuit.

The extra cost of AiResearch circuits is said to be negligible in view of the advantages that are gained through their use where a conventional printed circuit would be impractical.

EYELETS ARE STAMPED in holes on the printed circuits in this manner. Use of eyelets, of pure copper, is of considerable benefit to technicians who wire the circuits.

PACKAGING AND MATERIALS HANDLING

. . . begins on page 40

Dispens-A-Labels Devices
Dobeckmun Company
Dolliver and Brother
Durethene Corporation

Eastman Kodak Company
Ray T. Ebert Company
Eldon Manufacturing Co.
The Exact Weight Scale Co.

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Fairchilds, Inc.
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The Flintkote Company
Food Machinery and Chemical Corporation
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The Goodyear Tire & Rubber Company, Inc.
Adolph Gottscho, Inc.
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Harco Industries, Inc.
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W. L. Higgins Company, Inc.
Hilker Products
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Kaiser Aluminum and Chemical Sales, Inc.
Kimberly-Clark Corporation
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Macaulay Engineering Company
Machinery Mfg. Co., Inc.
The Magnelux Company
Mailler Searles, Inc.
T. R. Mantes Company
Marathon Corporation
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Matson Navigation Company
McKay-Davis Chemical Corp.
McKinley Equipment Company
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Modern Containers, Incorporated
Modern Packaging
Monsanto Chemical Company
Kenneth J. Moore & Co.
Motorola Inc.
The Multistamp Company
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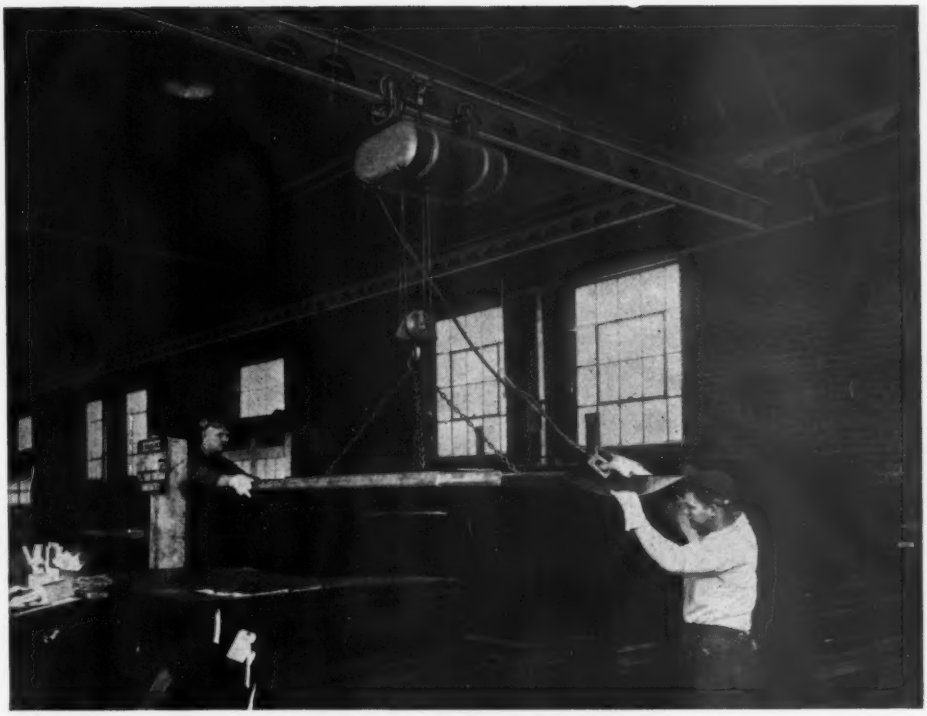

Photo T-4938 Handling one-ton packs of 26-gauge silicon steel sheets size 34" x 121" with inexpensive handpropelled Cleveland Tramrail crane and electric hoist.

TRAMRAIL System Cuts Sheet Steel Handling Time 37½%

STUDIES by Sangamo Electric Company, Springfield, Illinois, makers of precision electrical measurement instruments, revealed that even though their finished products are light in weight, materials handling amounts to a substantial percentage of the total factory payroll. Well over ⅓ of their handling costs is for raw material handling.

With a postwar production rate double that of prewar, it has been necessary for Sangamo to improve methods and purchase equipment to move greatly increased volumes of materials with a minimum addition of building and labor. A Cleveland Tramrail system for handling steel sheets in their receiving department, was one of the two most outstanding additions in this program made during 1948.

The Cleveland Tramrail system has reduced worker fatigue and accidents and has directly resulted in the saving of 12 manhours for every 70,000 lb. car of sheet steel unloaded. Whereas this job formerly required 32 manhours, it is now done in 20—a 37.5% reduction in time.

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OVERHEAD MATERIALS HANDLING EQUIPMENT

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features

- *Low operating cost*
- *Efficient service*
- *Good industrial relations*

(Fourteenth in Western Industry's plant construction series)

This new warehouse and office, latest addition to Republic Supply Co. of Calif., embodies the best design elements of previous similar installations. Result is a plant that works like a business machine.

LIKE ANY labor saving device from an adding machine to the most complicated accounting contrivance, an industrial plant should be designed in advance to reduce waste motion, lower production costs, and at the same time be a factor in good industrial relations through the pleasant working climate it creates.

The new million-dollar Northern division headquarters and warehouse of The Republic Supply Company of California at San Leandro furnishes an outstanding example of architectural planning and construction to meet the needs of modern scientific business management.

Because Architect George Vernon Russell had the operating experience data of the past three years from the firm's model plant at Los Angeles (which he also designed), the new San Leandro plant reflects all the adjustments, refinements and improvements suggested by study of operations at Los Angeles. (See *Western Industry*, November, 1949, pp. 38-41.)

To date, it is worthy of note, the Los Angeles plant has the lowest operating cost of any company unit. The San Leandro plant was designed to surpass this record.

From the Ground Up

Studies in scientic business management, as related to construction, have established the fact that the proper choice of a building site for a business structure is the primary consideration in planning for economical operation and efficient service.

A careful study of this phase by the management of the Republic Supply Company resulted in a choice of a ten-acre site in the new industrial tract at San Leandro which adjoins the East Bay Freeway.

The site was chosen as the most strategic location for rendering quick and efficient delivery service to the San Francisco Bay area and the inland territories of the Santa Clara Valley, the Fresno area and the regions tributary to the cities of Stockton and Sacramento. Company trucks serve all of these daily from San Leandro with ease.

From the Inside Out

Experience with the site of the main headquarters plant on the Santa Ana Freeway in Los Angeles had shown that delivery time was cut and that will-call customers could come out from the congested areas of Los Angeles and make the trip more quickly than a call nearer home base.

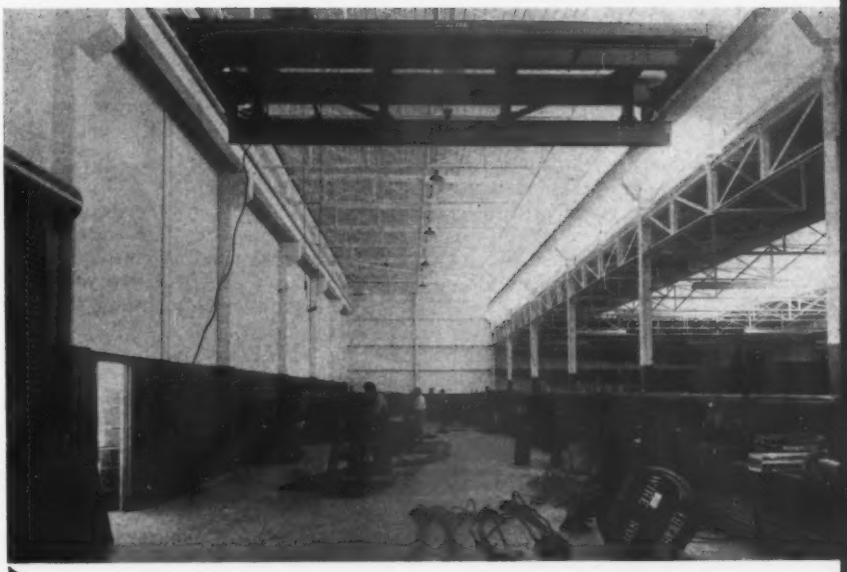
As in machine design, the Republic Supply plant was designed from the inside out. The interior was laid out

• Some of the high points:

TOP: Will-call department is light, airy, efficient.

CENTER: Crane bay runs the entire length of the warehouse, for handling heavy merchandise.

BOTTOM: Shipping platform has several ground levels to bring various heights of truckbeds to dock level.



Architectural Problems? None!

By

GEORGE VERNON RUSSELL

Architect, Los Angeles

When asked to describe "Problems" involved in the design and construction of Republic's San Leandro plant, I was at a loss. There were none!

Actually, the "problems" were solved several years ago when J. J. Pike subscribed to my belief in the pay-off of careful preliminary planning based on inside observation of business systems, production, traffic, personnel problems, etc., plus my theory that building cost is usually incidental compared to contents costs—including, by all means, human beings.

At that time, during the course of design and construction of the L. A. plant, I was made to feel that I was on the Republic team: the complications and vicissitudes of the business were explained to me. I was a party to policy, and "problems" were chopped down in conferences during preliminary planning.

Subsequent building programs, including San Leandro, have followed a similar pattern, except that the selling of design and planning was no longer a consideration — these had become a fixture in Republic's scheme of things to come.

Authority to make decisions for the company was delegated to Mr. Jayred, Northern Division Manager. I was invited to offer professional advice as to the desirability of several properties under consideration for purchase. The local deviations in business policies were clearly explained. All possible assistance and rapid decisions were offered by Mr. Jayred, and competent builders, Swinerton and Walberg, were elected to construct the job. No problems!

to fit the needs of departmental functions, workflow, inter-departmental exchange of operations, the furniture and equipment involved, comfort of personnel and other factors with a bearing on efficient operation.

Housing the Plant

When these needs had been met, the exterior shell was adapted to the inner mechanism like a housing for a business machine.

As was done in connection with the model company plant at Los Angeles, which influenced the design of the San Leandro structure, the architect's staff made a thorough study of company procedures, workflow, warehouse storage and handling systems, delivery methods, paperwork and other details of operation before a line of the plans was drawn.

Final layout for the interior was developed only after extensive data on these subjects had been compiled and tabulated. From this data, quarters for each department involved were spotted in locations which would minimize the motions necessary to maintain communication among them.

In turn, the equipment and furniture involved in the work processes was studied and provision made to house them for greatest efficiency by adapting the size and shape of quarters to the needs of the operators and equipment.

Knit to Fit

This flexibility of layout might seem to indicate the possibility of confusion and lack of standardization in interior construction, but final results proved the contrary. Modules, or units in space increments of five feet, were employed in layout and construction. This made it possible to meet all demands for space and still preserve unity of design.

In the warehouse, considerable study was given to proper binning, light and heavy storage facilities according to a system which had been highly successful in the company's other warehouses.

Planning Paid Off

To minimize waste motion in handling and shipping merchandise, particular study was given to the design of shipping facilities. The shipping dock was designed with sufficient width to accommodate fork truck movement; and while the platform is of uniform level, provision to accommodate the one-level platform to the varying heights of customer rolling stock was also made by establishing varying ground levels which bring truck beds on a level with the dock.

Preplanning also eliminated the necessity for righthand backing, usually a source of continual expense because it requires the time of two men.

Completely Scaled

The entire project was laid out in a scale model, showing furniture and equipment spotted in place, so that the management of The Republic Supply Company and the architect were in complete accord; a condition which is essential to final satisfaction and minimum of extras.

The complete structure is a model for efficiency, convenience and low-cost operation which goes with scientific management today.

WINDOW FRAMES were designed in five-ft. modules for uniform appearance and flexible design in the interior. Note use of file cabinets, with drawers opening in opposite directions, for partitioning the office working area, yet retaining spaciousness.

BUILDING FEATURES

Profiting by the experience acquired in operating the efficient plant at Los Angeles, many desirable features and improvements were installed in the San Leandro plant. These included placing the main entrance for easy access to all parts of the building with a minimum of walking.

"Let me get this straight!

Do I understand that we're getting 3,600 additional new freight cars to build up our service to shippers?"

That's correct, young man, and at a cost, incidentally, of more than 27 million. Included in the new cars are—

500 covered hopper cars for bulk commodities requiring closed-car transportation.

500 hopper-bottom cars that can be used for coal, ore, sand, gravel and similar shipments.

500 all-purpose, 50-foot automobile cars with special nailable steel floors designed to withstand heavy loading.

500 livestock cars of which 400 are double deck.

500 ore cars *equipped with roller bearings*, especially designed for ore shipments.

500 52-foot gondolas for steel, coal, gravel or any open-top commodities.

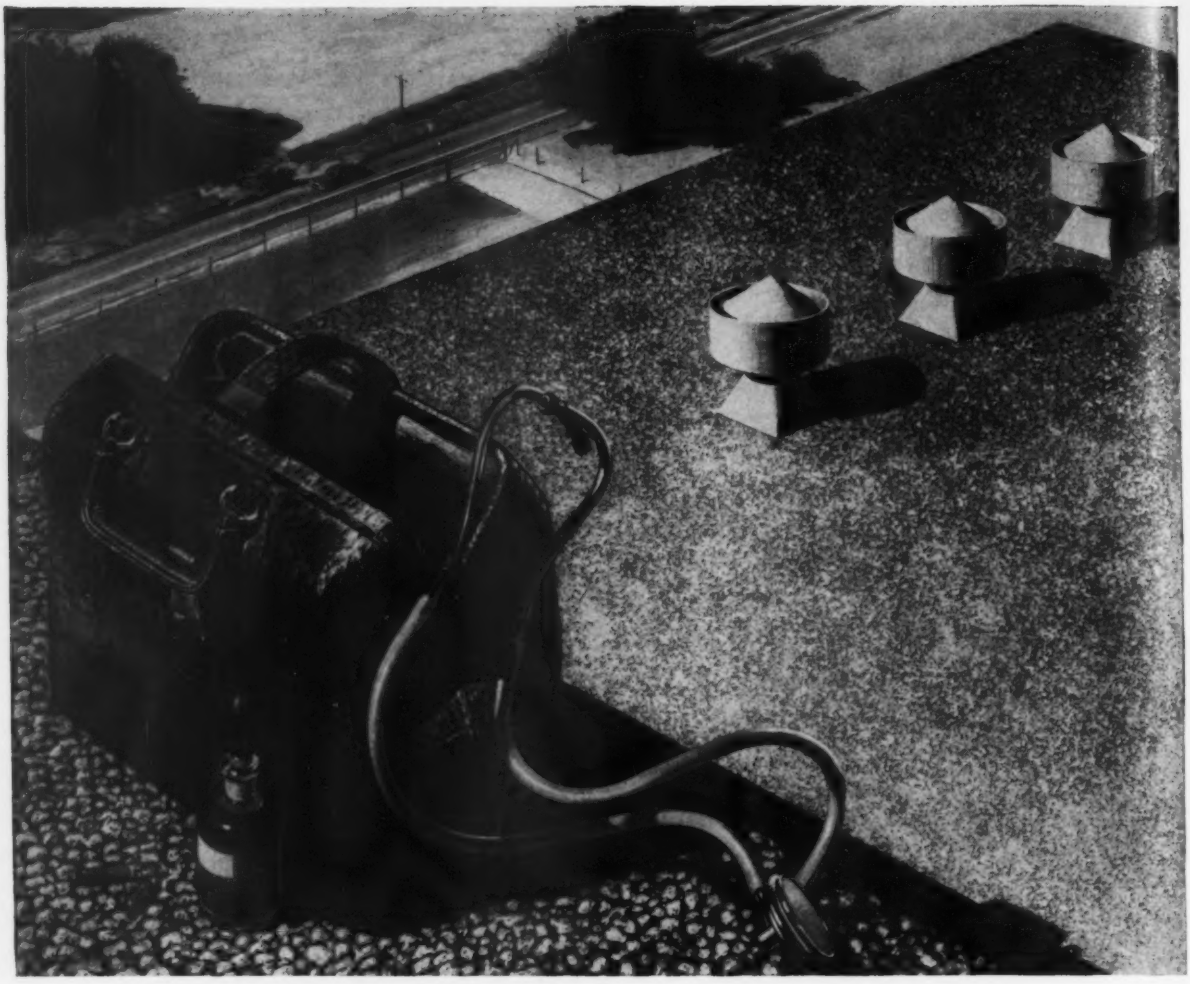
100 65-foot gondolas, with drop ends, for handling excessive length shipments.

500 all-purpose, 40-foot box cars of 50-ton capacity.

This extensive building program is planned for completion during 1953. Thus, Union Pacific keeps abreast of shippers' requirements for adequate, dependable transportation.

Be Specific – Ship "Union Pacific"

(Offices in 70 cities throughout the U. S. A.)



Roof that "doctors" itself!

● Cracks from weathering have a nasty habit of cropping up on roofs. If these cracks are overlooked or neglected, they grow bigger — deeper — and the roof is headed for expensive repairs.

But there's no such worry with a Koppers Pitch and Felt Roof. When a crack appears on the roofing surface, it's not long before the pitch starts to flow into the fissure . . . "doctors" the injured area by gradually filling it up and sealing it.

Besides being self-healing, Koppers Roofs have many other properties that result in long-life roofing. Take water-resistance, for example. Many Koppers Roofs are water-cooled; even though water completely covers these roofs, they still protect buildings and their contents effectively.

Koppers has confidence in its roofs —best proved by this fact: we will actually *guarantee* the performance of our roofing materials for as long as twenty years, provided, of course, they are applied by an Approved Roofer according to our specifications.

Koppers makes flat roofs for industrial *and* residential buildings. Specify Koppers, and you'll have the best in built-up roofing. Full information and specifications on request. Koppers Company, Inc., Tar Products Division, Los Angeles 1, California.

KOPPERS

KOPPERS COMPANY, INC., Pittsburgh 19, Pa.

Western District Office: 727 East Gage Ave., Los Angeles 1, California

OTHER DISTRICT OFFICES: BOSTON, CHICAGO, NEW YORK, PITTSBURGH, AND WOODWARD, ALABAMA

• SPECIFY KOPPERS FOR LONG-LIFE ROOFING •

CARPORT for visitors. Note lights and sprinkler heads in the ceiling. Well-planned landscaping enhances outside appearance considerably.

WALLS

To avoid as much as possible the inevitable marring of plaster walls, and reduce maintenance expense, all walls in the administrative area of the building are finished with a 3-ft. linoleum wainscoting.

SASH

All sash in the building is fixed, in order to insure uniform operation of the air-conditioning system. All sash was designed on 5-ft. modules for economy and uniformity of appearance from the outside.

FLOORS

All offices throughout the plant are floored with rubber tile which experience had shown to be easier to maintain, as well as being extremely durable.

CARPORT

A covered carport for executives and visitors is provided, having proved its desirability in the Los Angeles plant.

CEILINGS

Acoustic tile ceilings were installed throughout, and all doors were covered with tempered prestwood for durability and pleasing appearance.

PARTITIONS

Sound-absorbing, low, stub partitions, with built-in bookshelves for catalogs, were installed around all desks in the order and quotation departments; and to insure the efficiency and absence of waste motion which an orderly environment promotes, built-in storage space and shelving has been provided in all departments requiring this accommodation. Such facilities were installed in the sales, accounting, billing and pricing departments.

The lobby is lighted from luminous ceiling coffers of corrugated transparent plastic.

WAREHOUSE

For efficient operation of the warehouse and shipping department, separate offices have been provided. Orders may thus be processed (particularly will-calls) without the time lag which would naturally exist if paperwork had to move between warehouse and administration offices.

WHO DID IT

Architect: George Vernon Russell, Los Angeles, Calif.

General Contractors: Swinterton & Walberg Co., Oakland

Subcontractors:

Steel . . . Soulé Steel Co.

Gunite . . . Johnson Western Construction

Toilet Partitions . . . Price Building Specialties, San Francisco

Plumbing, Heating and Ventilating Scott Co., Oakland

Scale . . . Fairbanks, Morse & Co.

Vault Door . . . Mosler Safe Co.

Sprinklers . . . Herman Lawson Co.

Rubber Tile . . . "California Brand," Mallot & Peterson-Grundy, Oakland

Ceramic Tile . . . Gladding McBean & Co.

Fencing . . . Cyclone Fence Co., Oakland

Pneumatic Tube System . . . Standard Conveyor Co., San Francisco

Sliding Glass Doors . . . Arcadia

Paint . . . General Paint Corp.

FLOOR HEATING

To solve the common problem of discomfort for employees in a cold warehouse, with consequent impairment of efficiency, the warehouse floor has been laid with a radiant heating system of hot water pipes installed in the concrete floors.

LIGHTING

Natural lighting for the warehouse has been obtained with a series of monitors with continuous glazing. Ventilation comes from louvers at the ends of these monitors.

TRANSITE WALL

One entire wall of the warehouse is made of corrugated transite. Construction provides for easy removal when expansion becomes necessary, and this wall may be salvaged 100 per cent.

MATERIALS HANDLING

A continuous crane bay runs along the south wall of the warehouse. With this crane, all heavy equipment in storage may be reached and handled.

WILL-CALL DEPARTMENT FACILITIES

Republic Supply's system for handling will-calls has set a record for handling an order, and waiting time is at the low average of 10 minutes. A numbered grid painted on the floor enables order pickers to assemble several orders at once, and allows more than one picker to work on an order. While the customer is waiting, however, provisions have been made for his comfort and diversion. The San Leandro will-call department is provided with seating accommodations and merchandise displays which furnish an additional sales presentation and help to offset waiting time as well.

Giving a lift to the West

THE needs of western industry call for immense quantities of Kaiser Steel Pipe . . . which is used in a wide variety of ways.

For example, Kaiser Steel Pipe is required for such diverse uses as hydraulic car lifts, pump columns, structural columns, feeder lines, residential gas mains, pipelines to transport gas, oil and water.

Kaiser Steel Pipe is also used for plumbing, heating and ventilating systems in homes, schools, hotels, apartments and factories.

To meet all these needs, Kaiser Steel produces a complete range of pipe as part of its diversified line of steel products . . . providing a nearby, dependable source for industries that serve you.

It's good business to do business with

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built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

First national conference on clay technology

UNIVERSITY OF CALIFORNIA at Berkeley, California, will be the meeting place on July 21-25, for the first national conference on clays and clay technology.

Purpose of this conference is to provide an opportunity for those engaged in some phase of fundamental studies of clays and clay technology to gather and share scientific and technologic knowledge, and engineering experience.

The Conference steering committee is composed of G. L. Gates of U. S. Bureau of Mines, J. Schlocker of U. S. Geological Survey, M. D. Turner of California State Division of Mines, and I. Barshad, H. E. Davis, C. M. Gilbert, I. Goldberg, W. P. Kelley, A. Klein, A. Pabst, W. H. Somerton, and J. A. Pask, Chairman, all of the University of California, Berkeley. Dr. R. E. Grim is the honorary chairman.

Cooperating agencies include U. S. Bureau of Mines, U. S. Geological Survey, U. S. Bureau of Reclamation, California State Division of Mines, American Association of Petroleum Geologists, American Institute of Mining and Metallurgical Engineers, American Society of Testing Materials, Mineralogical Society of America, Soil Science Society of America and Nat'l Clay Minerals Committee.

ENGINEER TEASER

HERE is a touchy welding problem. A firm in California is restricted from doing repair welding within a building because hydrogen gas fumes are in the air.

They would like to find portable equipment that would provide a fresh air atmosphere in the immediate welding area and thus avoid danger of explosion.

They have three specifications for this equipment:

1. It must be small enough to pass through narrow aisleways,
2. It must be readily handled by one man, and
3. It must be able to be put in use quickly.

Who has had similar experience? Who can supply either equipment or information to satisfy this problem?

Please address your answer to this "Engineer Teaser" to Editor, *Western Industry*, 609 Mission St., San Francisco 5.

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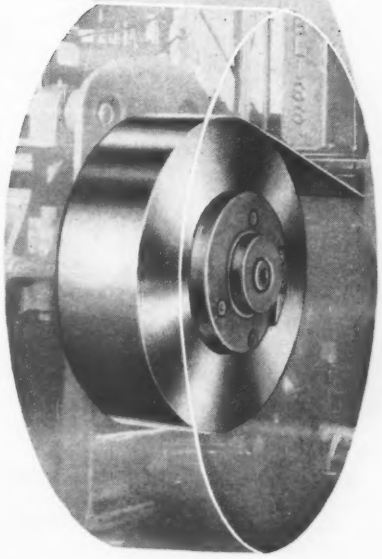
Calstrip supplies cold rolled strip steel for the manufacture of everything from business machines and appliances to hard facing welding rod and military aircraft. Calstrip has expanded mill and annealing facilities ... and now offers increased ranges in thickness from .010" to .125" and widths up to 13".

For strip steel of any temper—or with special edges—save at Calstrip mill prices. We'll do our utmost to supply your allotment.



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for every piping requirement

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BRACKETS, HOOKS, CLAMPS for attachment to walls, columns and beams

Light Welded Steel Bracket
fig. 194
max. load: 750 lb.

Medium Welded Steel Bracket
fig. 195, max. load: 1500 lb.
heavy welded steel bracket
fig. 199, max. load: 3000 lb.

Side Beam Bracket
fig. 202
load: 150 to 2300 lb.

Side Column Bracket
fig. 203
load: 150 to 390 lb.

Cast Iron Bracket
fig. 223
load: 610 lb.

Cantilever Bracket
fig. 221
with angle iron ext.
fig. 222

Single Hook
fig. 168
½ to 3 IPS

One Hole Clamp
fig. 126
⅜ to 4 IPS

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Adj. Swinging Hanger Flange
fig. 155, for ⅜ to ⅞ in. rod
flange only
fig. 156, for ¾ to 12 in. pipe

Swivel Hanger Flange
fig. 154
for ⅜ to ⅞ in. rod

Pipe Hanger Flange
fig. 153
for ⅜ to ⅞ in. rod

Ceiling Flange
fig. 128
for ⅛ to ¾ IPS

Adj. Clip Base
fig. 116
for ¾ to 2 in. pipe
⅜ in. rod size

Wrought Clip, Long
fig. 263
short: fig. 262
½ to 4 in. pipe

Tin Clip
fig. 231
¼ to 2 in.

U Hook
fig. 205
¾ to 8 in. pipe

Call Your Local Grinnell Distributor or write for Hanger Catalog.

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AMERICA'S #1 SUPPLIER OF PIPE HANGERS AND SUPPORTS

pipe fittings • nipples • welding fittings • pipe hangers • diaphragm valves • unit heaters • prefabricated piping

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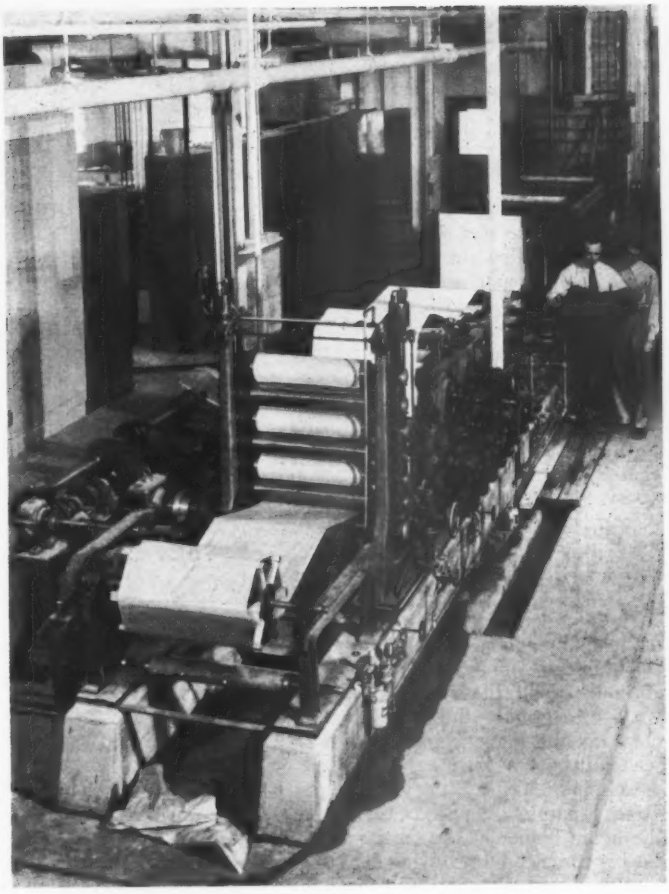
PILOT PLANT

right in the mill solves problems without disturbing production

All processes in Crown-Zellerbach's paper mills and converting plants can be duplicated on operating scale



ALTHOUGH only 37 feet long, experimental machine makes paper exactly like the big ones, producing 24-inch sheet. Chain drive couples Westinghouse 15-hp. DC motor generator set to main driveshaft.

AMERICAN PAPER industry's finest and most complete development laboratory has just been opened on the West coast. Scientists say it will rapidly accelerate the development of new paper products and new chemical by-products, the latter from paper mill wastes.

This laboratory is located at Camas, Wash., center of research for the West's largest manufacturer of pulp and paper products, Crown Zellerbach Corporation.

Complete Under One Roof

Half a million dollars has been invested in the new facilities which include under one roof a complete pulp and paper mill on a pilot plant scale. The new laboratory serves as a working partner to the research laboratory built in Camas in 1939, which will continue to be used for small-scale fundamental and applied research.

The new laboratory, on the other hand, will take the findings of bench research and carry them through the development processes to the point a product or process is ready for commercial manufacture.

Schedules Never Disrupted

The unique characteristic of the new laboratory is the pilot-size equipment, designed to duplicate all processes in the corporation's paper mills and converting plants on a scale that will be economical to operate, easy to handle and easy to observe. "This," says Dr. Wendell W. Moyer, Crown Zellerbach's director of research, "will speed up the corporation's program of improving the quality of existing grades of paper and developing new products and processes."

Until now, research men at Camas have had to use commercial papermaking and converting equipment in Camas, or in Crown Zellerbach's Portland, West Linn or Lebanon, Ore., operations to make experimental runs. Failure of a trial run can cause interference with production. Expense and disruption of mill schedules by trial runs has had the effect of slowing up development work.

Now a product or process can be studied and tested under conditions duplicating actual production in the company's West coast mills. When test runs are ready for commercial equipment, most of the "bugs" will have been worked out and the step-up to full production can be made with a minimum loss of valuable time.

Adequate Building

The laboratory building is 75 ft. wide by 200 ft. long built of reinforced concrete with a steel truss roof. Walls are of tilt-up construction. It is designed against 10 per cent earthquake shock, and is equipped with a modern wet pipe sprinkler system, augmented by dry-powder hand extinguishers and water hoses strategically located.

Along the full length of the building, on the front is a 25-ft. area used for office space, wash rooms, testing laboratories and a cold room for storing materials.

The 50 by 200-ft. work area is well drained, lighted and heated and fitted with convenient services. Two open trenches in the floor, covered with steel grating, run the length of the building and connect with the sewer. The concrete floor slopes to the main trenches.

A worker setting up an experiment anywhere in the area has close at hand convenient outlets for steam at seven, 30 or 150 lb. per sq. in. pressure; alternating current at 110, 208 or 550 volts; water at 140 lb., compressed air at 90 lb., and propane gas. To certain points sulfur dioxide and chlorine gas are available from cylinders.

The work area has 16 ft. headroom except for 25 by 80 ft. center section that is 30 ft. high. This section has a 40 by 18 ft. open well for tall equipment and pilot plant construction. A machine shop is located nearby.

Miniature Operations

In the experimental pulp mill, chips are made by a hand-fed, 10 knife Carthage chipper from wood of stove size. Although small, the chipper chews up wood into exactly the same kind of chips as the giant chippers in full-scale mills.

Cooking 350 lbs. at a time, the digester separates the wood fibers from the lignin binder in the same way as the big commercial revolving digesters that hold several tons. Built entirely of type 316 stainless steel, the digester can be used for almost any conceivable method of papermaking that has been or is likely to be developed.

Acid Plant Also

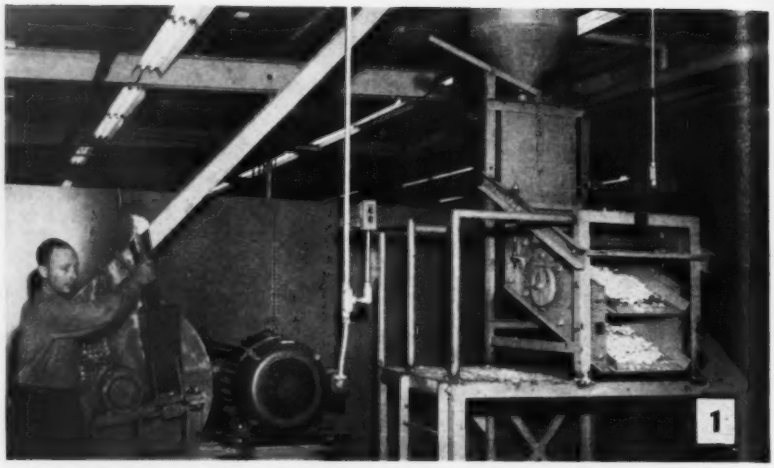
The stainless steel accumulator alongside the digester can be used for making sulfite cooking liquor, for absorbing relief gases and for liquor storage. It performs the functions of an acid plant in a full-scale mill.

Other equipment in the pulp mill includes two kraft liquor tanks, a dilution tank, pulp screen, decker, two pulp chests, a chlorinator, bleaching tank, beater, and midget jordan.

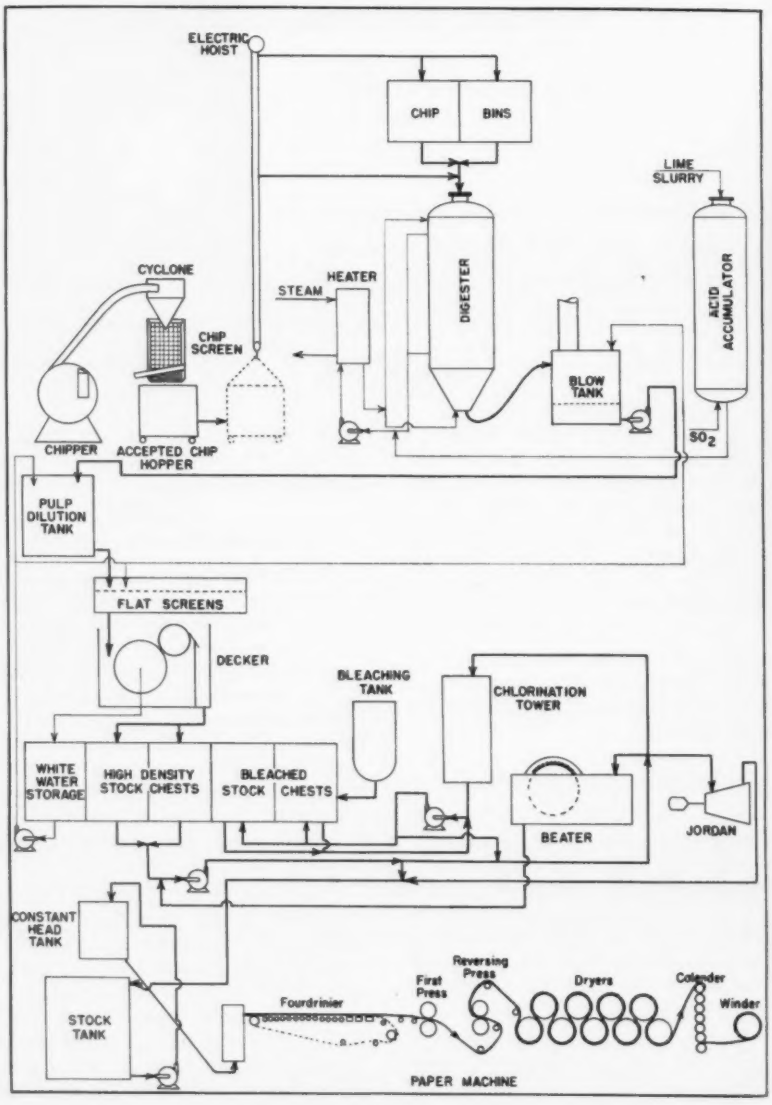
All equipment is integrated into a smoothly-working operation by conveyors and piping, and when desired, any group may be used separately or by-passed when not necessary in a given experiment. In designing and locating equipment, great care was taken to obtain versatility, to fit into the broad outline of future developments as research men foresee them.

Small, But No Toy

The center of the experimental paper mill is a rebuilt Pusey & Jones paper machine that is 37 ft. long and produces a 24 in. sheet of paper. It



SCHEMATIC DIAGRAM OF CAMAS PILOT PLANT



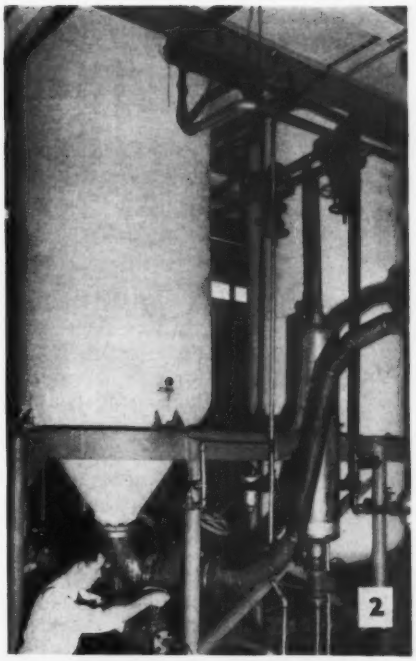
OPERATING GLIMPSES

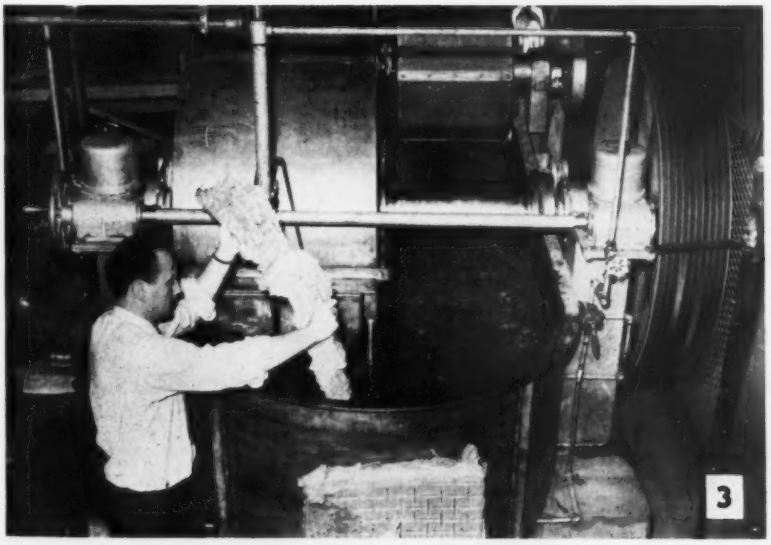
1. Carthage chipper with 30-hp. motor operating at 800 rpm., takes stovewood size "logs" up to 5 inches in diameter. Double-deck Dillon chip screen (right).

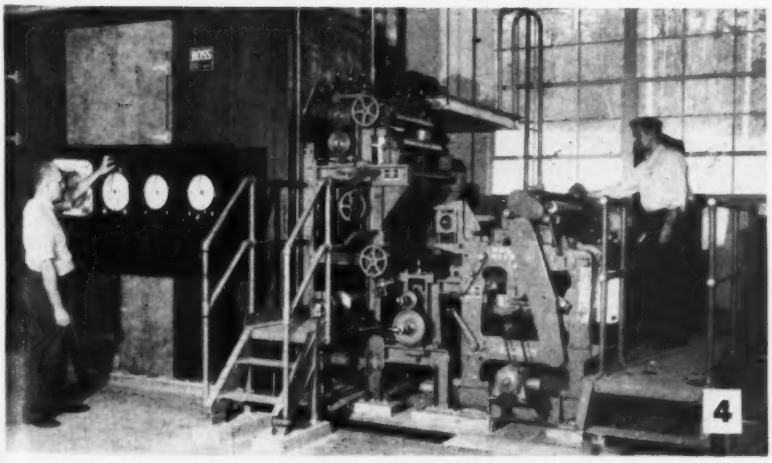
2. Stainless steel experimental digester (left) made by Alaska Copper Works, holds about 350 lbs. pulp. Accumulator for making sulfite liquor shown at right.

3. 250-pound stainless steel beater was fabricated by E. D. Jones & Sons Company, driven by 75-hp. motor connected by ten V-belts to driveshaft.

4. First coating machine of its kind. Takes 25-inch sheets and is more versatile than any commercial equipment. Built by Waldron. J. O. Ross dryer, left.







looks small compared with one of the machines 420 ft. long in the nearby Camas paper mill that produces a 154 in. sheet. But it is in no sense a toy. It makes paper exactly the same way and has the added advantage of being small enough to permit close study of its performance.

The machine is a combination cylinder and fourdrinier so that either method of forming a sheet can be used. It will operate at speeds from 25 to 250 fpm, depending upon the weight of the paper.

Coater Is Unique

Unique in the research field is the specially built coater manufactured by John Waldron Corporation, with the dryer by J. P. Ross Engineering Co. This machine will do reverse-roll coating, airknife coating, gumming, saturating and laminating of papers. No commercial equipment is so versatile. The machine is 40 ft. long, will take a sheet 25 in. wide at speeds up to 300 ft. a minute. The dryer or oven has five compartments with automatic temperature control.

Research Speeded Up

In addition to its function as an experimental machine, the coater will produce a product large enough for salesmen's samples and field studies.

Armed with these new tools, Crown Zellerbach scientists are eagerly launching their speeded-up research and development program. They have a large backlog of projects for the initial "big push." All are aimed at developing better paper products and more by-products.

Chemicals from Chips

While West coast lumbermen are installing equipment to produce chips for papermaking from their wood waste (*Western Industry*, April 1952), Crown Zellerbach research men will be developing means of recovering and using on a commercial scale the chemicals in the chips that are largely wasted in the manufacture of paper. Other fields of research include the development of sources of cellulose from materials other than wood and the use of synthetic fibers. But new and improved paper products and new uses for paper will always be the prime goals of research.

As these products and processes are developed (research men say "when," not "if"), Crown Zellerbach can continue expanding its West coast operations within the framework of its sustained yield policy; more and better products and more profits will be available from the same wood supply it now has.

WHY SKILLED WORKMEN Prefer

RIDGID

Small Ratchet Threaders

Drop head sets to thread ⅛" to 2"

Extra Fast Easy Pipe Threading

RIDGID Bolt Dies 00R-B ¼" to 1", National Coarse and Fine Thread

★ Heads snap into ratchet ring from either side, won't fall out.

★ Precision-cut alloy dies reverse for close-to-wall threads—no special dies needed.

★ 00R & 0R, ⅛" to 1"; 111R and 11R, ⅛" to 1¼"; 12R, ⅛" to 2". Conduit dies available.

★ Buy at your Supply House.

THE RIDGE TOOL COMPANY • ELYRIA, OHIO

RIDGID Work-Saver Pipe Tools

In this plant

THE EYES HAVE IT

. . . thanks to planned lighting

By A. R. PARKER

Lighting Specialist, General Electric Supply Co., San Francisco

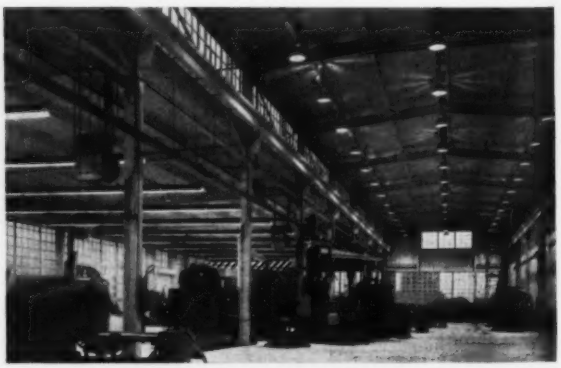
WHEN PLANNING their new plant at Belmont, California, Western Gear Works gave top consideration to the often forgotten problem of lighting. The problem was to obtain a high level of comfortable efficient light so that manufacturing of gears and transmission cases could be carried on 24 hours per day if necessary.

In one 40 ft. bay devoted to the manufacture of smaller gears, three-lamp 96-in. industrial slimline fixtures operating on 430 milliamps are mounted in continuous 32-ft. rows, 15 ft. on centers, 16 ft. from the floor. This produces an even level of 60 footcandles of light free of shadows and creates a minimum of glare on the shiny metal parts.

Walls and machinery are painted a light gray-green and the ceiling, a water-white.

The adjacent bay, in which heavier parts are manufactured, does not lend itself to tubular lighting because of the necessity of mounting fixtures approximately 26 ft. high in order to clear cranes. High bay mercury luminaires would produce the most economical system but could not be used exclusively because of the objectionable color of mercury lights.

Accordingly, alternate units of 400-watt mercury and 1,000 incandescent are used, thus receiving approximately equal amounts of light from each unit and reducing the power requirements by 30 per cent, if incandescent had been used exclusively. These units are mounted 13 x 15 ft. on centers at a height of 26 ft., thus allowing adequate overlap to produce evenness of light and color balance.



Lightness of the floor provides enough reflected light to make a low brightness contrast between fixture and ceiling.

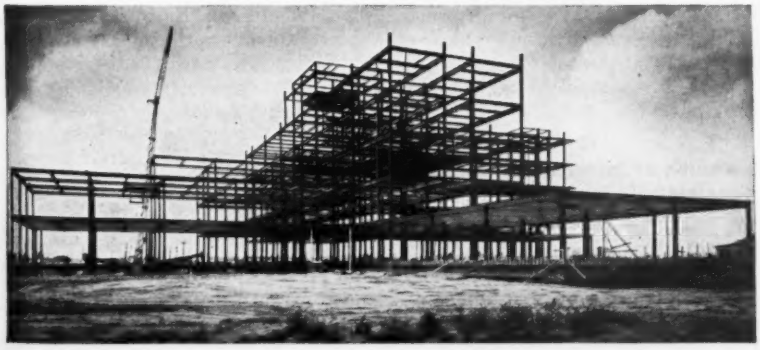
This lighting installation was awarded a Merit Award with distinction certificate by the Merit Award Competition Committee, at the Fourth International Lighting Exposition and Conference, Cleveland, Ohio.

For the lighting layout, Mr. Les Martin of Western Gear solicited the cooperative services of Coopman Electric, the electrical contractor, the sales engineer and lighting engineer from General Electric Supply Corporation, Mr. Long and Mr. Parker, and local lighting engineer of the Miller Company, Mr. A. T. Bergeron.

New Landmarks Taking Shape Along the Pacific Coast

SEATTLE — Grosvenor House, an 18-story reinforced-concrete building with 370 apartments, 19 stores, garage, and roof garden. 1500 tons of reinforcing steel used in the floors and 35 miles of Rayduct steel pipe for the radiant-heating system were furnished by Bethlehem Pacific.

Earl W. Morrison, *Architect;* W. H. Witt Company, *Structural Engineers;* University Plumbing and Heating Company, plumbing, heating and ventilating systems.



SALINAS — The Salinas Valley Memorial Hospital in Monterey County, California. Built along functional lines, this structure will have 108,470 sq ft of floor area. In addition to patients' rooms and operating rooms, it will have allergy rooms, clinical laboratories, and extensive X-ray rooms.

Bethlehem Pacific fabricated and erected the 560 tons of structural steel in this building. Robert Stanton, *Architect;* Parker, Steffens & Pearce, *General Contractors.*

SAN LEANDRO — Addition to the San Leandro, California, plant of the Dodge Division of the Chrysler Corporation. This 2-story building will provide 690,000 sq ft of floor area, automobile storage, and assembly lines. It contains more than 4500 tons of structural steel fabricated and erected by Bethlehem Pacific.

Swinerton & Walberg, *General Contractors;* George H. Miehls, *Structural Engineer.*

BETHLEHEM PACIFIC COAST STEEL CORPORATION

General Offices: San Francisco

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Here's a "must" for all industrial users of abrasives or cutting tools.

Pacific Abrasive Supply Co. announces a beautifully bound, graphically illustrated, 252-page catalog that's handsome enough to be in your library. From front to back it's crammed full of vital information about every high-quality abrasive and cutting tool under the sun...contains detailed descriptions, prices, other useful facts and figures...a complete reference work that makes your job easier.

At your written request, our sales representative will gladly supply you with your free copy of this big Pacific Abrasive Supply Co. catalog.

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HELPFUL LITERATURE

for the plant operator who wants to keep informed

701

Truck and caster catalog

A newly-revised 36-page caster and truck catalog, covering an expanded line of equipment is released by *The Rapids-Standard Co., Inc.* This two-color, fully indexed brochure has photos and complete specifications on casters and wheels designed to handle light, medium or heavy loads on all types of floor surfaces.

702

Historical data on hydraulics

"It Started with an Apple" is title of a handsome brochure published by *The Hydraulic Press Manufacturing Co.*, on the occasion of its 75th anniversary. This is the story of the progress of hydraulics and the application of hydraulics to American industry, documented by actual history of this firm.

703

Info on hand operated valves

Hand operated valves for air, water and low pressure hydraulic services produced by *Modernair Corp.* are fully described in a pamphlet available from *The Rucker Co.*

704

A wealth of information about industrial air tools

A 74-page publication fully describing and illustrating *Aro Equipment Corp.'s* complete line of industrial air tools, is published by that company. General specifications are included and application data given.

705

All about centralized instrumentation

New Bulletin 85-20, available from *Minneapolis-Honeywell Regulator Co.*, consisting of 32 pages, describes conventional and graphic type panelboards, as well as the measuring and control instruments utilized in centralized control of industrial processes.

706

Production and maintenance cost cuts graphically outlined

A leaflet featuring actual case histories showing savings in production and maintenance through use of a new non-critical (no nickel) electrode for all types of cast iron or cast iron to steel structures is available from *Eutectic Welding Alloys Corp.* Booklet contains photographs of applications resulting in savings up to 80% in replacement costs and full 100% increase in production; plus technical data on applications, and physical properties.

707

Simplified estimating of Lucite equipment costs

A price schedule offering a simplified formula for estimating costs of H-T Lucite equipment used in electrochemical processing, is now being distributed by *Singleton Co.* Included with the price list is an illustrated bulletin detailing that firm's complete line of plating cylinders, tanks, liners, baskets, buckets, trays and cells.

708

Notes for cleaning large tonnages on a production basis

Of particular interest to shops facing the problem of cleaning relatively large tonnages on a production basis, is a bulletin which explains a process of continuous airless blast cleaning, and illustrates how it is being applied in actual practice. Available from *American Wheelabrator & Equipment Corp.*

709

Safety device data

A 24-page catalog, published by *McDonnell & Miller, Inc.*, is designed primarily as a workbook to help in selection and application of that firm's safety devices for steam and hot water boilers and heaters. This publication should be of interest to design men and consulting engineers as well as heating contractors.

710

Simplified cleaning explained

"Scientific Cleaning for Modern Metal Finishing" is title of an illustrated brochure issued by *Kelite Products, Inc.*, which explains how to streamline cleaning and processing jobs through application of compounds utilizing principles of Kelite pH Control.

711

On small precision cutting tools

"Small cutting tools of extreme precision" is title of a catalog, available from *Woodruff & Stokes Co., Inc.*, which describes a complete line of small precision tools including carbon-steel taps, prong dies, small reamers,

hollow mills and centering tools. Interesting case histories are included.

712

Learn about pumps—at home

Two new instruction texts on pumps, prepared for home study, are now included in International Correspondence Schools courses. Written by Kenneth R. Gromlich, books cover selection, installation and operation and management of pumps.

713

Goodrich "funnies" tell about competitive enterprise

In a 32-page, four-color cartoon booklet entitled "Johnson Makes the Team," and published by *B. F. Goodrich Co.*, competitive enterprise is pointed up by a case history showing growth and development of the rubber industry. Copies free upon request.

714

Tool steel bulletin

"Tool Steels for the Fastener Industry" is an 8-page booklet, published by *Universal-Cyclops Steel Corp.* containing descriptions of properties and typical applications of this company's products.

715

News about tracing cloth

A four-page, two-color booklet describing Brutex tracing cloth, developed by *Charles Bruning Co., Inc.*, is available from that firm. Product is identified as "the finest drawing surface your pencil can touch."

716

About speedy paint removal

Klem Chemicals, Inc., has produced a new folder describing "strip aid" and the advantages it offers industry in speeding up removal of paints, enamels, and lacquers, from conveyor hooks and equipment from parts.

717

An industrial analysis of Walla Walla, Washington

Industrial Committee of the *Walla Walla Chamber of Commerce* is offering a 29-page community survey for those interested in sites for industrial expansion. Because of its proximity to Columbia Basin irrigation project, Walla Walla offers a challenging opportunity to new industry.

718

How to mechanize your payroll procedures

A case history folder issued by *Remington Rand Inc.*, outlines the advantages of planned punched-card expansion in this age of ever larger and more complex payroll operations. Folder

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or for more information on **NEW MATERIALS AND EQUIPMENT**

described in the following pages. Also, coupon may be used to obtain complete information on products advertised in this issue.

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Your Water Treatment Problem

and how to handle it

A booklet covering the essentials of water analysis, filtration, softening, scale removal, cost reduction by recirculation, cooling tower efficiency.

Plus

a tabulation of water analyses for hundreds of cities in the eleven Western States.

This is a reprint of a series of articles which appeared in *Western Industry* in 1950-1951. The tabulation of water analyses is the only thing of its kind available anywhere.

Single copies . . 50¢ each*
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Please send me ..... copies of your water booklet. Check for $..... (including Calif. sales tax enclosed.

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.....

tells how *Pesco Products Division of Borg-Warner Corp.* mechanized its accounting system through the use of punched card equipment manufactured by Remington Rand.

719

A "must" on marking machines

A general purpose marking machine, manufactured by *Jas. H. Matthews & Co.*, is fully detailed in a colorful folder available from that company. Learn about these easier, faster, legible markings and how they can simplify your plant operations.

720

Sheet metal fabricator booklet

Wales-Strippit Corp. has just released Catalog 10-A illustrating and describing its sheet metal fabricator which features hole punching, notching and nibbling operations as performed by this unit.

721

"Floors without flaws"

A twelve-page practical guide for economical and efficient care of floors in office buildings, factories, etc., is released by *A. C. Horn Co., Inc.*, which covers conditioning, repairing and maintenance methods of wide variety of floor materials.

722

Learn about valve controlled record keeping

A bulletin available from *National Records Management Council* will tell you about valve-controlled record keeping and how it can reduce office record keeping costs 90% and average records storage costs more than 50%.

723

Info on crane cab coolers

A complete line of crane cab coolers and conditioners is described in a new 24-page, illustrated booklet available without cost from *Dravo Corp.* Brochure includes complete specifications for various models and suggests how and where to use them.

724

"Dust and Fume Topics"

American Wheelabrator & Equipment Corp. publishes a pamphlet devoted to solutions for dust and fume control problems. Lead oxide, wood and rock dust, as well as mica collection in roofing manufacture are all thoroughly discussed. Equipment and methods for handling these problems are carefully detailed.

725

Steel castings specification chart

Standard specifications for more than 70 designated classes of steel castings are incorporated in a comprehensive new summary chart compiled by *Steel Founders' Society of America.* Chart should be an extremely helpful reference aid to design engineers and purchasing department engineering staffs, since it covers pertinent data on virtually all general engineering types of steel castings, together with recently adopted specifications and some revisions of previous specification standards.

726

Industrial porcelain enamel characteristics described

A detailed 16-page booklet on the use of porcelain enamel in industrial applications is available from *The Erie Enameling Co.* Publication contains sections on types of porcelain enamel, and descriptions of various attainable physical characteristics, including abrasion resistance and resistance to high temperatures and thermal shock.

727

"Eyelet Setting Data"

An informative 12-page booklet, issued by *Edward Segal*, is believed to be the only comprehensive publication available on eyelet setting. In non-technical terms, it tells just what eyelets are, how they should be selected and how they can be employed to best advantage. Eyelet attaching machines are also discussed.

728

Improving submerged arc welds

Fixing the cooling rate of welds made in medium alloy steels by submerged arc process, to improve ductility and control grain growth, is covered in "Predetermination of Preheat and Postheat for Submerged Arc Welding," prepared by *Linde Air Products Co., Division of Union Carbide and Carbon Corp.* Included in this literature are results of bend tests of weld beads deposited without preheat-

3537-24—Martin R. Klitten Co.—252

ing or postheating. These are compared with results of similar tests made with preheating and postheating for varying times and at various temperatures.

729

News about liquid-tight gloves

Information about hand protection is disbursed by *The Pioneer Rubber Co.* in a new catalog showing how to choose the right protective glove for the job. Liquid-tight all neoprene, neoprene coated and vinyl coated industrial gloves are fully described.

730

ACCL directory now available

The 1952 revised edition of the *American Council of Commercial Laboratories, Inc.*, directory is now obtainable by writing to the Council at 4302 East-West Highway, Washington 14, D. C.

731

Complete information on Malcomizing hardening process

A 24-page booklet just published by *Lindberg Steel Treating Co.* tells complete story of Malcomizing process for surface hardening stainless steels. Twenty-six illustrations and tables help describe process in detail.

732

Babbitting practices detailed

"Hints on Babbitting Practice," just released by *Federated Metals Division of American Smelting and Refining Co.*, outlines basic steps for prevention of common bearing failures, and covers everything from choice of metal for a particular bearing application through the correct pouring practice to in-service maintenance.

733

Helpful information for gage block users

The DoAll Co. offers some extremely useful aids for those concerned with the use of gage blocks—"Height-Combination Tables, Heat-Expansion Calculator Book." These pieces of literature are very helpful and easy to use.

734

Attention, grain milling men

Link-Belt Co. releases Book No. 2392, devoted to conveying, processing and power transmission machinery particularly adapted to grain milling and processing industries.

735

Electrical contacts data

A 12-page catalog, issued by *Gibson Electric Co.*, is designed to aid in selection and use of electrical contacts throughout a great variety of equipment fields. Recommendations for specific applications are included.

tangle-proof power line for moving machinery

APPLETON REELITE

TRADE MARK

CONSTANT DUTY

You can cut cable costs, speed work and prevent delays and accidents when power for your mobile electrical machines is supplied through Appleton Constant Duty Reelites. These ruggedly built Reels automatically take up and pay out conductor cable—hold cable gently taut, preventing breaks, kinks, tangles. For use with hoists, lifting magnets, cranes, chargers, generator sets—an endless variety of machines requiring flexible power supply.

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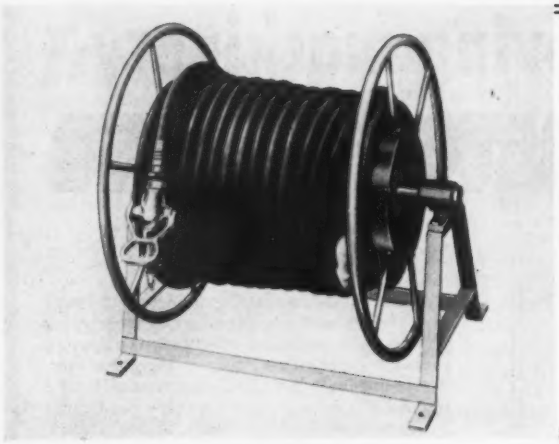
APPLETON

CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES
EXPLOSION-PROOF FITTINGS • REELITES

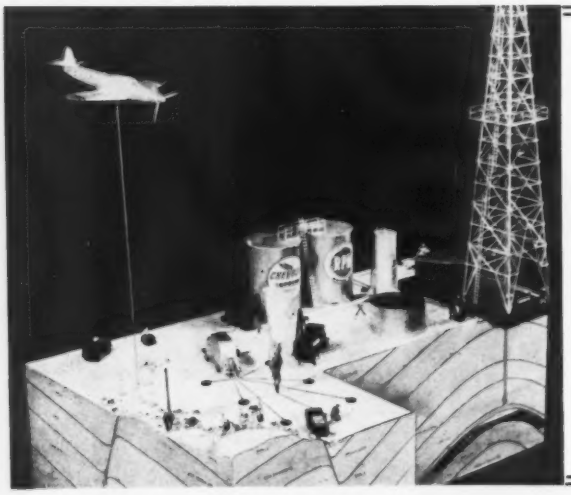
NEW MATERIALS & EQUIPMENT

COUPON ON PAGE 63 provides an easy way to obtain more information on products introduced.



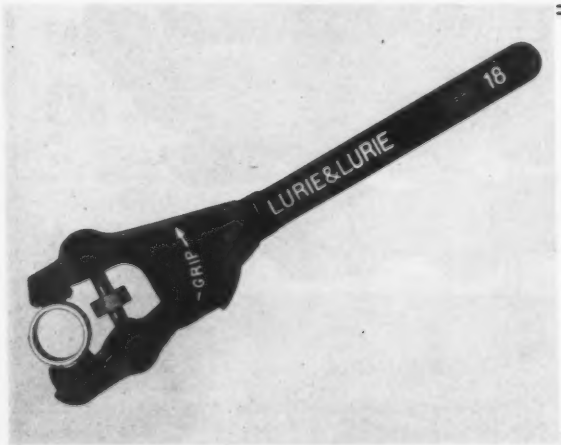
736—Quick acting hose reel

This hose reel facilitates quicker action on fires because water pressure is available at hose nozzle while hose is still coiled on reel. Swivel joint connection in pipe line permits application of full stream of water while hose is being unreeled. This not only eliminates time required to turn on valve after hose is run out, but also eliminates kinks and tangles and time required to straighten them. Universal mounting permits easy installation. Manufacturer is *Wirt & Knox Manufacturing Co.*



737—Model oil field project

A low-cost scaled model kit, which, when assembled, shows the exploration, drilling, production and storage of oil, can accomplish an educational and a public relations job for industry. This "learn by doing" project, which is technically accurate, was developed by *Standard Oil Co. of Calif.* There are over 100 pieces in the model itself, and kit also contains a teaching handbook and other reference material. Comes in mailing tube which can later be used for storage. Manufacturer, *Models of Industry, Inc.*, plans similar models for other industries.



738—Ratchet action pipe wrench

This ratchet-action wrench is especially efficient for work on pipe in such hard-to-get-at places as against floors or walls or close to corners because its toggle design allows force to be applied to circumference of pipe, eliminating crushing action of standard wrenches. "V" shaped swivel jaw combined with special shaped opposing jaw align themselves so that double the number of teeth, as used in conventional wrenches, grip pipe. Wrench handle is designed for easier, firmer grip. Inserts are replaceable. Manufacturer is *Lurie & Lurie.*

739

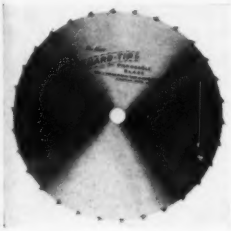
"Candid camera" quality control

For X-ray quality control operations is a portable X-ray machine which is light enough to be easily transported to any job site. With this equipment crane-handling and expensive crew time are virtually eliminated. Weight of transformer, complete with tube and coolant, is approximately 110 lb.; diameter is less than 15 in., and over-all length is 38½ in. It is easily adaptable to trailer mounting. Available from *Triplett & Barton, Inc.*

740

Disposable saw blade has teeth that stay sharp

Heinemann Saw & Manufacturing Co. is manufacturing a wood-working saw with a hard-tip blade which is low in cost and disposable when dull. This means that sharpening is eliminated. A new process of hardening enables this saw to stay sharp from four to six times longer than conventional saws. Super-hard short teeth cut faster, smoother and quieter. Saw never develops cracks and is always round and efficient. Works equally well on any type saw machine.



741

Three-spindle turret head

A three-spindle turret head which can be attached to any drill press and which permits sequence drilling, countersinking and tapping on a single drill press spindle is manufactured by *Commander Manufacturing Co.* Tool provides selection of speeds on each spindle for drilling, reaming, counterboring and tapping at recommended speeds. Quick hand lever indexing of turret head is accomplished without stopping drill press motor. Capacity on all three spindles is ⅜ in.

742

Special model portable intercom designed for difficult operating conditions

A new model of *Vocaline Co. of America, Inc.'s* wireless portable intercom and public address system, the Vocatron, is designed for operation where power and electrical conditions vary. This 3½-lb. model incorporates a special silencing circuit which maintains the unit in a static-free state. Because each unit is portable and requires no extra wiring, two, three or more Vocatrons make up an extremely flexible intercom, paging or limited public address system. Can be plugged into any standard 105-120 volt outlet.

The man on the job...

wants VICTOR'S Versatility!

This man with a VICTOR torch welds mild steel extension handles onto high carbon pliers—a small and ticklish job. The same torch, by simple change of nozzles and tips, can be quickly converted to new job needs, such as welding large castings, heating, brazing, descaling, flame priming, soldering—or to cutting, by addition of cutting attachment.

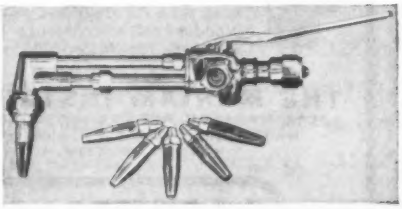
VICTOR's precision-built apparatus also gives you better flame control, saves gas, gets work done faster. Ask your VICTOR dealer for an on-the-job demonstration NOW

LOOK FOR THE VICTOR DEALER SIGN!

Ask him to show you why it costs less to own and operate VICTOR.

Dealer inquiries invited.

VICTOR
Welding and Cutting Equipment since 1910



Model 2450 Cutting Attachment for VICTOR 300 Series Welding Torches cuts metal up to 8" thick.

VICTOR EQUIPMENT COMPANY
3821 Santa Fe Ave. LOS ANGELES 58
844 Folsom Street SAN FRANCISCO 7
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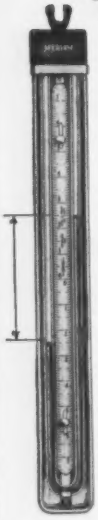
MERIAM INSTRUMENTS FOR INDUSTRY

For 37 years we have been solving measurement problems by supplying standard or special instruments to accurately measure pressures, vacuums and flows of liquids and gases. We have constantly improved, developed and diversified the line so as to meet fully all needs of the field.



U-TYPE MANOMETERS

The Clean-Out Manometer (at left) for line pressures up to 100 lbs. per sq. in. A wing nut permits the Manometer body and tube to be disconnected from the head — the tube cleaned with a brush furnished or tube replaced, and the instrument reassembled without disconnecting the head section from the piping. Send for Bulletin No. 1.

The Model A-995 WM Manometer for line pressures up to 400 lbs. per sq. in. These instruments are built with heavy walled annealed straight Pyrex tubes, gland packed top and bottom in steel end blocks and clamped to the body at fixed intervals to prevent distortion. Catalog Sheet A-995 WM gives complete details.

WELL-TYPE MANOMETER

Model A-275 WM (at left) is a direct reading type for line pressures up to 150 lbs. per sq. in. Standard construction; ranges — from 6" to 24". Wall mounted type shown; also available in flush mounting. Ask for Catalog Sheet A-275 WM.

SIGHT FEED BUBBLER

This Sight Feed Bubbler with 2⅛" dia. bowl of Pyrex glass is good for line pressures up to 50 lbs. per sq. in.; of plastic, for pressures up to 100 lbs. Sturdily built with brass or semi-steel body. Supplied in ring type (shown) and strap type. Needle valve controls bubbler rate. Ask for Bulletin 21.

THE MERIAM INSTRUMENT CO.
10988 MADISON AVENUE • CLEVELAND 2, OHIO
Western Division: 4760 E. Olympic Blvd., Los Angeles 22, Calif.
In Canada: Peacock Bros., Ltd., Montreal

MERIAM ★ Instruments ★
ESTABLISHED 1911
MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

Use coupon on page 63 for more information

743

Precision waveforms with controllable characteristics

A series of three new instruments is being produced by *Tektronix, Inc.*, to fill a need in fields of biophysics, geophysics, computer development, etc., for a source of precision waveforms with controllable characteristics. Type 160 is capable of supplying the necessary AC and regulated DC voltages to operate six of the other two types (161, 162) in any combination. It is completely regulated to compensate for line voltage fluctuations over the range of 105 to 125 volts, and for changes in load. Type 161 pulse generator supplies rectangular pulses of known and variable amplitude and duration, of either positive or negative polarity. Type 162 provides a linear sawtooth waveform, a positive gate, and a positive trigger.

744

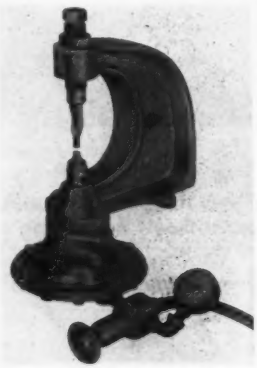
Adhesive for hard-to-join metals simplifies bonding

A new thermosetting resin compound, Armstrong Adhesive A-6, requires only contact pressure for joining metals. It cures at room temperature in from 1 to 36 hours, depending upon temperature. A-6 is recommended for joining hard-to-bond metals to other metals, wood, plastics, glass and hard rubber. Shear tests often exceed 3,000 lb. per sq. in. at room temperature. Compound contains no volatile solvent and does not shrink, swell or creep. Since it is a polymerizing, two-component system, consisting of a viscous paste and curing agent, very close control over bonding is possible. Available from *Armstrong Products Co.*

745

Lightweight air-powered riveter is fast and economical

A new air-powered riveter, very fast in operation, light in weight and low in price, manufactured by *Barrett Equipment Co.*, can be used for riveting, de-riveting, punching, forming and stamping merely by changing tools. Unit can be installed on bench, base or stand and it requires only one simple air line connection. It is furnished with either foot, hand or automatic control. An air line pressure of 100 psi. produces working pressure of 1,100 lb. with 11/16-in. stroke.

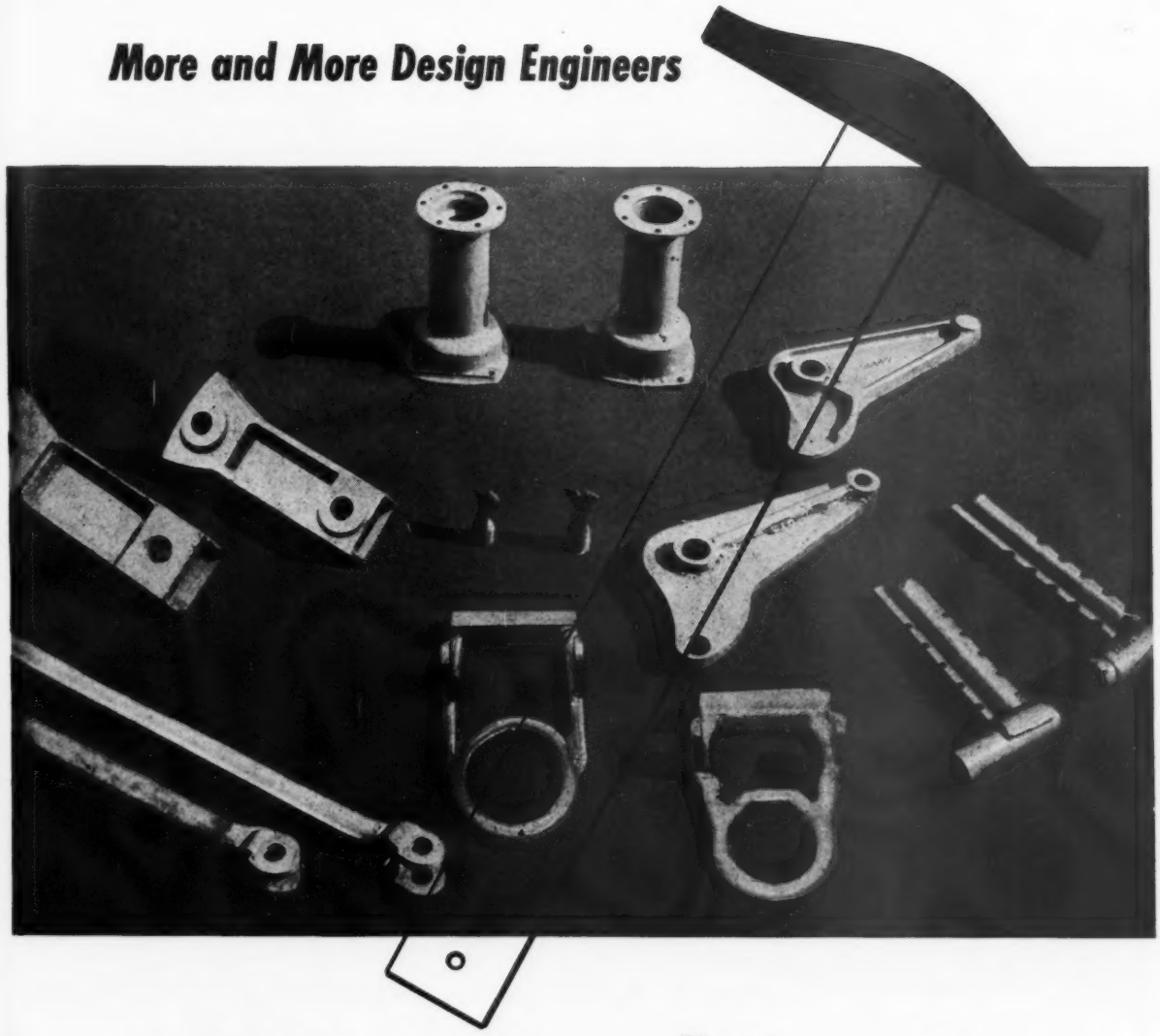


746

Water soluble cutting fluid

A synthetic cutting fluid that forms a clear solution with all proportions of water at room temperature gives superior results in drilling, tapping, turning, sawing, milling, punching and drawing stainless steel and other metals. It produces cooler workpieces and makes possible faster cutting, less tool burning and longer tool life, closer tolerances and better finishes. It can be rinsed from metal surfaces with cold water. Fluid left on parts provides a rust protective coating. Manufactured by *Carbide and Carbon Chemicals Co.*

More and More Design Engineers



Specify K-B Electric Furnace Steel Castings

It may pay you to consider these outstanding advantages of using electric furnace steel castings for many parts now being fabricated: 1) You have a wide range of carbon and alloy steels to work with, 2) You get strength with less weight in many parts because you can put cast steel where it's needed, 3) You may save not only weight but *cost* as well.

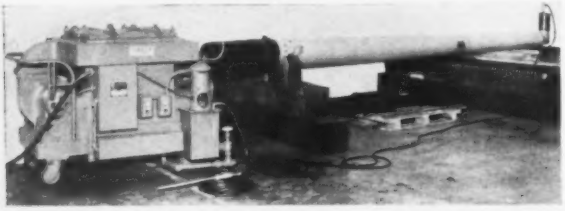
Kay-Brunner is producing steel castings for more and more parts formerly manufactured by other, often costlier methods. More than 27 years of experience are at your service in helping you design parts for steel castings. There's no charge or obligation for consulting with our engineers and getting cost estimates. Phone CU. 3-2141.

KAY-BRUNNER STEEL PRODUCTS, INC.
999 SOUTH MERIDIAN AVENUE, ALHAMBRA, CALIFORNIA

747

You can "shoot" off grease with this equipment

A portable gun barrel degreaser, produced by *Currier Co.*, removes grease and protective coatings quickly and economically by automatically forcing non-inflammable



Trichlorethylene vapor through its gun barrel. Removes grease or compound, together with condensed vapor, drains to a closed container, leaving treated surface chemically clean in a matter of minutes. Trichlorethylene solvent is later recovered for re-use by a simple distillation process, and residue of removed grease is run into containers for convenient disposal.

748

Creep testing machine with power-operated lifting mechanism

A lever-arm creep testing machine of 12,000-lb. capacity, manufactured by *Arcweld Manufacturing Co.*, has a power-operated lifting mechanism for weights used in loading specimens. During testing, lifting platform automatically positions itself about ½ in. below weight pan so that shock of dropping weights is minimized when specimen breaks in stress-rupture tests. Machine is suitably designed for testing special alloy steels used in high temperature applications such as jet engines and gas turbines. It has an exceptionally large furnace with three heating zones, temperature control equipment mounted on stainless steel panel, and a wiring system accessible from front or rear.

749

Painting your roof can mean January in June

"Roof Coolerant" is a new type of roof paint, which can be brushed or sprayed on by unskilled labor. It immediately reduces below roof temperatures as much as 26 deg., because it deflects up to 75% of the sun's radiant heat. Roof Coolerant consists of large metallic aluminum flakes applied with a special liquid bond. In addition to its cooling effects, this paint prevents rapid drying out of roof as well as cracking and leaking. It also helps roof retain flexibility needed for expansion and contraction caused by sudden temperature changes. Manufacturer is *Tropical Paint and Oil Co.*

750

Phos-copper brazing alloy available in paste form

"Phos-Copper," a free-flowing brazing alloy of copper and phosphorus, with a low melting point for copper and copper alloy brazing operations, is available in paste form from *Westinghouse Electric Corp.* Phos-Copper's fluidity and wetting properties provide good capillary action that enable it to penetrate tight-fitting joints instantly to form a strong, ductile bond. New paste, which is composed of powdered Phos-Copper suspended in petroleum jelly, requires no flux or brazing rod for joining, since application of paste between the two elements to be joined takes the place of a rod.

PEAK PRODUCTION
Demands Dependable
Dick
BARRY CONVEYOR PULLEYS
Welded steel construction. Light in weight yet extremely strong. They're easy to install. Available in a wide range of sizes for all general conveyor services.
DICK ROPE V-BELT DRIVES
V-Belt and sheaves operate with engineered efficiency. Give maximum service with minimum stretch . . . Resilience maintained. Sheaves carefully balanced and accurately machined to minimize belt wear.
POWER TRANSMISSION AND CONVEYING EQUIPMENT
Industry has recognized through years of experience that Dick power transmission and conveying equipment has a reputation for greater efficiency . . . longer life . . . and rugged ability to absorb repeated peak operating demands. Call or write the R & J Dick Co. office nearest you for help in increasing the efficiency of your production.
FACTORY SALES REPRESENTATIVES FOR
ATLAS ROLLER CHAIN, SEWALL ROLLER CHAIN SPROCKETS, GILMER V BELTS AND HIGH SPEED ENDLESS BELTS.
BARRY STEEL SPLIT PULLEYS
Scientifically designed — electrically welded construction. Light in weight. Easy to install. Maintain exact shape under all loads.
DICK'S BALATA BELTING
Constructed of hard surface, closely woven duck. Thoroughly impregnated with Balata Gum. Free from stretch and shrinkage — and moisture resistant. High in power transmission efficiency. All "Dick-belts" guaranteed.
MF 331
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SAN FRANCISCO 7, CALIF. 510 BRYANT ST. SUTTER 1-1341
SEATTLE 4, WASH. 307 MARITIME BUILDING MUTUAL 1922

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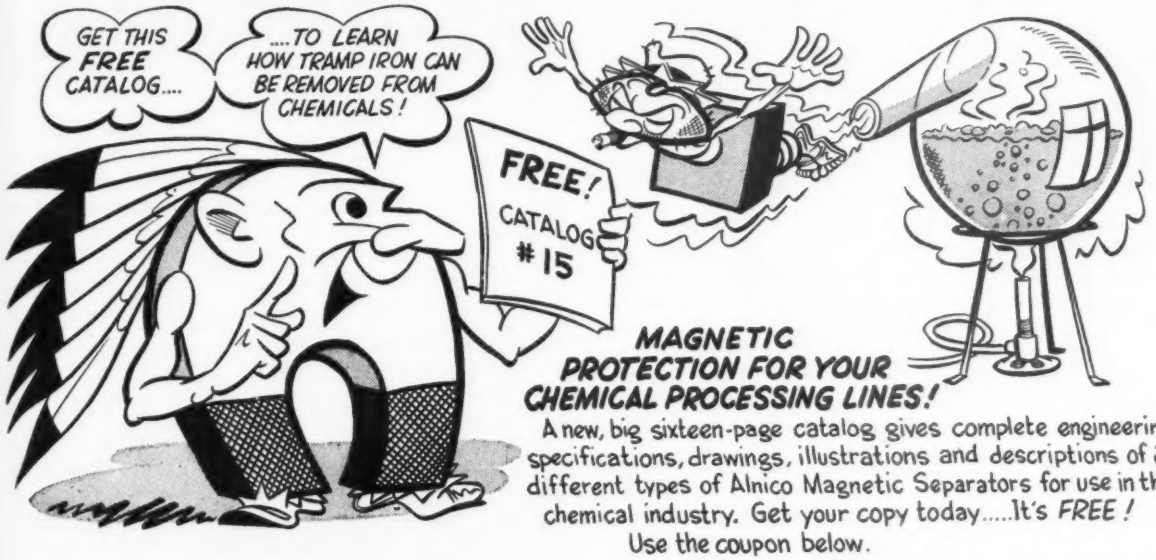

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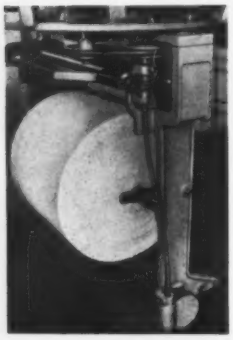
751

Flexible shaft power drive designed for bobbing mechanism

Elliott Manufacturing Co. produces flexible shaft power drives that are especially adaptable for bobbing mechanisms in knitting machines. In installations of this type use of a flexible shaft drive makes it possible to go around one of the supports of the machine without use of miter gears, thus simplifying the design and reducing number of parts. Special core, of a type and grade of wire fitted to meet operating conditions of considerable strain, is used because a bobbing motion centers strain in one area.



752

Belt grinding attachments with unusual qualifications

Maneuverability of portable grinder and utility of abrasive belt are successfully combined in *Buckeye Tools Corp's* new belt grinding attachments. These attachments, available in two sizes, consist of a contact wheel, a supporting arm mechanism and an idler pulley which supports and aligns abrasive belt. Contact wheel provides a firm, resilient backing for abrasive belt, which is aligned and supported by idler pulley. A releasing device permits quick, easy change of belt when worn. Serrated rubber contact wheel provides a controlled breakdown of bond of abrasive belt, eliminating glazing and doubling belt service life.

753

One-piece molded elastic piston seal

"HydroSeal" is a one-piece molded elastic piston seal designed as an alternate for diaphragm or piston operated devices. It is leak proof, and movable and can be incorporated into design of pneumatic and hydraulic motors, glands, shaft seals, valve seals, cylinders, pumps and brake mechanisms. It is designed to include a return spring rate. By variations of wall thicknesses or varied compounding or rubber-like material, seal can be designed with given rate for return strokes, eliminating springs, counterweights and other devices. Available from *Farris HydroSeal Corp.*

754

Cleated belt conveyor's speed is 55 feet per minute

A low-cost cleated belt conveyor for handling light stampings, screw machine products, scrap and similar press-room and machine shop material called the "Press-Veyor, Jr." can speed up plant operations by maintaining a smooth

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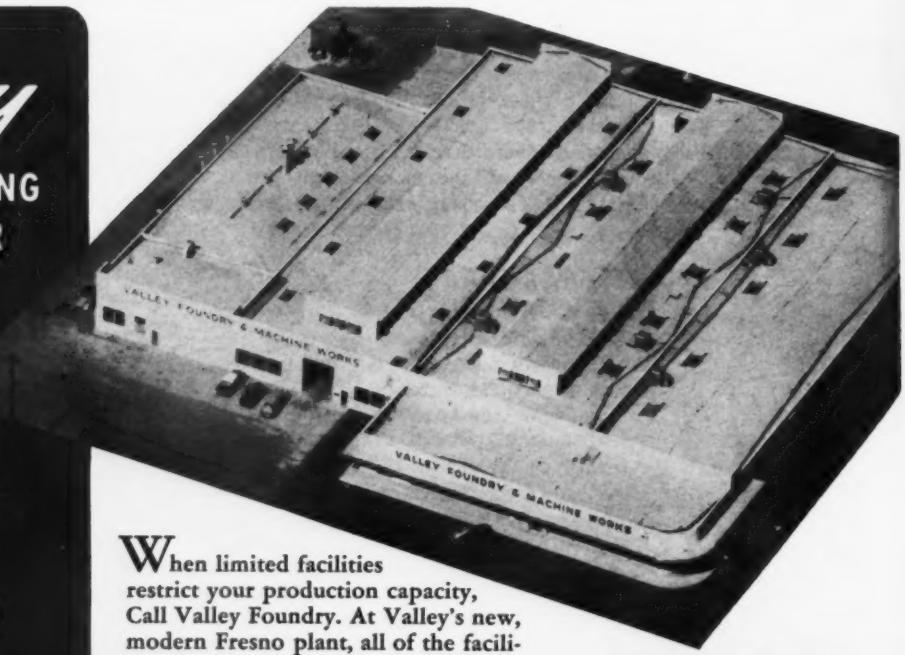

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flow of goods from production machines to tote boxes. Comes with woven cotton, Neoprene or waterproofed woven cotton belts, with steel cleats spaced on 23-in. centers. Standard belt speed is 55 fpm. Available from *The Rapids-Standard Co., Inc.*

755

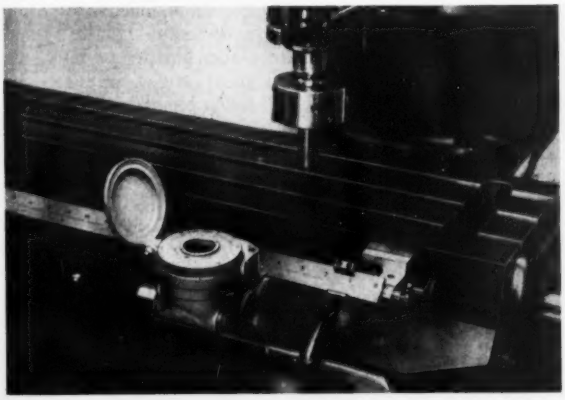
Mercury safety switch

Designed for vertical panel mounting, is a mercury switch engineered for safety in hazardous, explosive locations. Switch is mounted on a lever-operated armature, and is set in operation by a selector knob or pushbutton which inclines armature, thereby actuating mercury switch. Any possibility of spark is eliminated because of the all-mechanical nature of actuating linkage. *Tigerman Engineering Co.* is manufacturer.

756

Measures machine tools quickly and accurately

"Scan-A-Scale" is a new device for making fast, accurate, dependable linear measurements on machine tools. It consists of two microscopes and two satin chrome finished



scales graduated in 50 thousandths of an inch. By rotating a dial on microscope, the 50 thousandths graduation on scale can be divided so that readings to four decimal places are easily determined. This instrument eliminates need for micrometers, loose standards and dial indicators which often give inaccurate measurements under pressure and temperature variations. Available from *F. T. Griswold Manufacturing Co.*

757

Put this arm around it to hold it tight

A crane arm, developed by *Towmotor Corp.*, offers new efficiency in handling cumbersome loads. Readily interchangeable with standard Towmotor forks, this crane arm expedites plant-wide movement of heavy engines, castings, dies, long bars and similar bulk materials. In addition, the accessory facilitates placing such loads into otherwise inaccessible places.

758

For longer lasting signs

Fastening signs securely and attractively to small diameter poles is greatly simplified by a new sign bracket developed by *A. J. Gerrard & Co.* A standard strapping tool is all that is needed to secure bracket to any pole of 1½, 1¾, 2 in., or larger diameter. Solid, secure attachment is assured by the fact that bracket is in contact with at least 67% of the pole circumference. Trim design and galvanized finish give bracket lasting good appearance.

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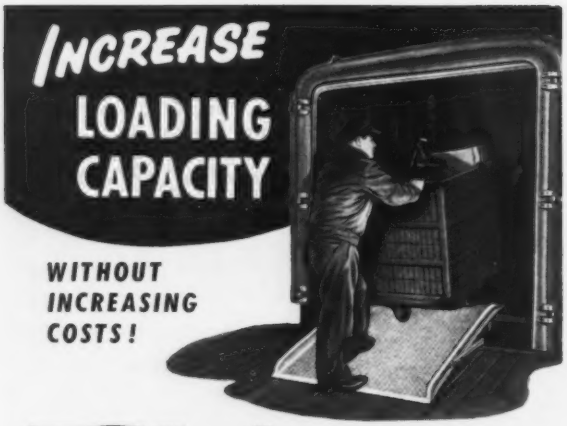

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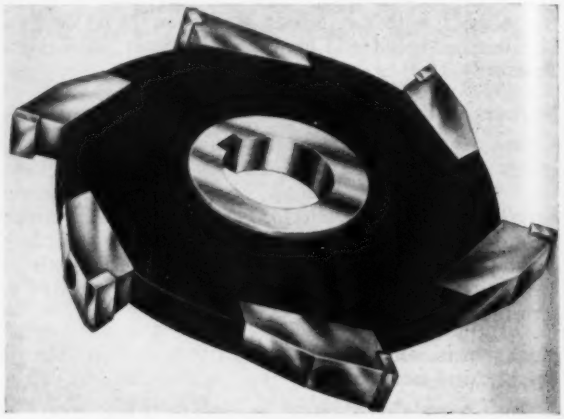
759

Carbide tipped milling cutter

This carbide tipped milling cutter combines advantages of solid and inserted blade types. Interchangeable blades are seated on periphery of cutter body with tail end seated



against an abutment in body. Cutting forces are transmitted to body through this abutment. Heat treated body bound screws accurately locate blades against body abutment through a conical seat. Versatile bodies can be bladed for straight slotting, alternate blade slotting or half side milling. Changes in rake and shear angles required for cutting various materials are accomplished by a quick change of rapid mounting blades. Blade changes cannot damage bodies as there are no wedges, serrated surfaces and body slots. Manufacturer is *Millet Division, Kraus Design, Inc.*

760

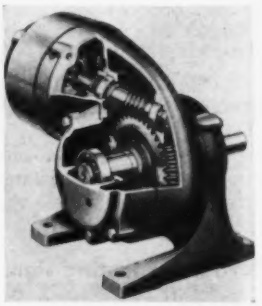
Decorative plastic tile walls have two usable sides

Duo-Tex plastic wall tile is unique because of its large size (9 x 9 in.) and because it is the only plastic tile on the market which has two useable sides. There is a regular ribbed pattern on one side and a striated ribbed pattern on the other. Both are excellent bonding surfaces. Available in nine decorator-tested colors. Manufactured by *Industrial Plastics, Inc.*

761

Right-angle worm gear motor

This low-speed right-angle worm-gear motor incorporates a cantilever design to protect gear alignment. Mounting stresses are absorbed by a rugged single unit pyramidal base with spread eagle feet. Gear and motor housing are free from distortion. It embodies splash lubrication, a hardened and ground worm, leakproof oil seal and asbestos protected windings. It has self-locking brake action. Parabolic contour of motor housing gives unit a pleasing appearance. Produced by *U. S. Electrical Motors, Inc.*



762

Gives old floors new life

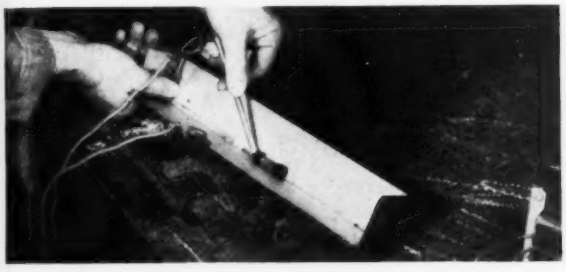
Steelhard, a compound made of extra tough resins and non-stone aggregates, is ideal for resurfacing and patching floors that accommodate extremely heavy traffic. It forms a hard, tough, resilient surface that permits the heaviest

of loads to roll easily and smoothly. Developed by *The Monroe Co*, for use over concrete, Steelhard will withstand heavy traffic four to six hours after application. It comes ready to use without mixing or thinning and is easily applied over unroughened concrete by simply priming old flooring surface, spreading to a thin layer and rolling to a smooth surface. Comes in an attractive gray color.

763

Removes heat discoloration from welded seams

A new improved method for removing heat discoloration from welded seams, especially effective on hard-to-get-at inside corners, utilizes an alternating current power source.



Equipment consists of a short length of copper rod, some rubber tubing, electrical wiring, clamps, a small stepdown transformer and a solution of 50% phosphoric acid. Discolored weld seams can be treated at rates of two to four ft. a minute. This electrolytic process leaves weld area clean and bright. Developed by research division of *Armco Steel Corp.*

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764

Dial test indicator is sturdy and accurate

A lightweight dial test indicator, designed by *Lufkin Rule Co.*, results in greater accuracy and durability. Its one-piece base and shank cannot be loosened. Simplified

mechanism excludes the customary train of gears, resulting in smoother and more sensitive action. Jeweled thrust bearing also greatly increases smoothness and insures accuracy. All greasing and oiling are eliminated. Hole attachment screws directly into base. Outside knurled ring contains dial and is adjustable so that zero can be set to any position in relation to pointer.

765

Fire protection for any building

"Albi" fire-retardant coatings applied with spray gun or brush provide immediate and effective protection against fire. When fire strikes an Albi coated surface the mat or

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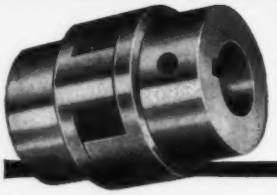

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The concave jaw surface of the new Gerbing Flexible Coupling actually holds the resilient synthetic rubber insert or spider in position, thus eliminating any tendency of the rubber to break or extrude. Capable of handling peak loads, shocks and overloads. Instantly compensates for angular and parallel misalignment.

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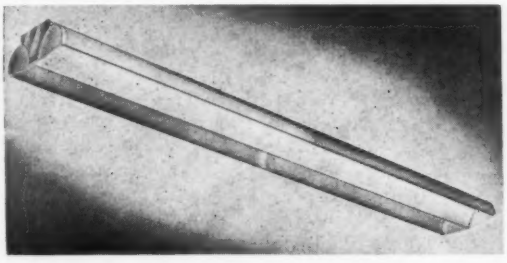
Use coupon on page 63 for more information

"puff" formed not only holds flame and heat away from combustible surfaces, retarding the spread of flame, but also acts as an insulating blanket, retarding heat penetration to the surface, thus preventing structural failure. Applicable to wood, plaster, acoustical tile, metal. Comes in white or standard colors. Manufactured by *Admiralty Manufacturing Co.*

766

Versatile "Industrial Four" lighting adjusts readily to Western industry

Especially designed for America's growing industries with rapidly changing lighting requirements (characteristic of the West) is a new type of fixture designed by *Columbia*

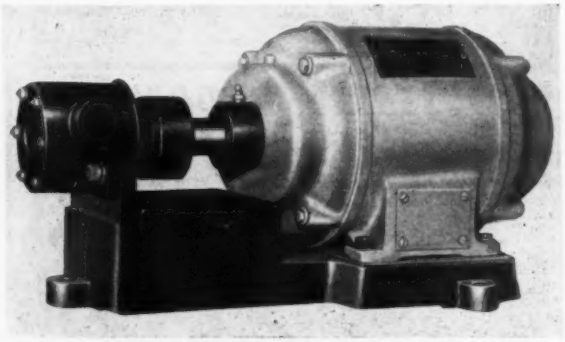


Electric & Manufacturing Co., known as "Industrial Four." Basic channel is an open type housing providing a large continuous wireway with easy access to ballasts and lampholders. Channel can be supported by chains, rods, or sliding clamp hangers. Interchangeable reflector and side panel combinations can be attached in a few seconds, to provide the following: alzac sides and reflector for low brightness requirements; baked enamel sides and reflector for general manufacturing areas; and plastic sides and enamel reflectors for service areas. Addition of a cross baffle louver provides 25 x 25 deg. shielding for office and administrative areas. Louver is also adaptable to first two units.

767

High capacity pump adapted for corrosive materials

Jabsco flexible impeller pump, designed for high capacity applications, is now available in hard rubber construction for handling acids, alkalies and other corrosives. Pump



delivers 15 gpm. at 22-ft. head, or 5 gpm. at 72-ft. head. It is self-priming, pumps viscous or thin liquids, is resistant to alkalies, solutions of metallic salts, organic acids, etc. Pump has self-lubricated impeller which outlasts conventional metal rotors and gears; is self-compensating for wear. Available from *American Hard Rubber Co.*

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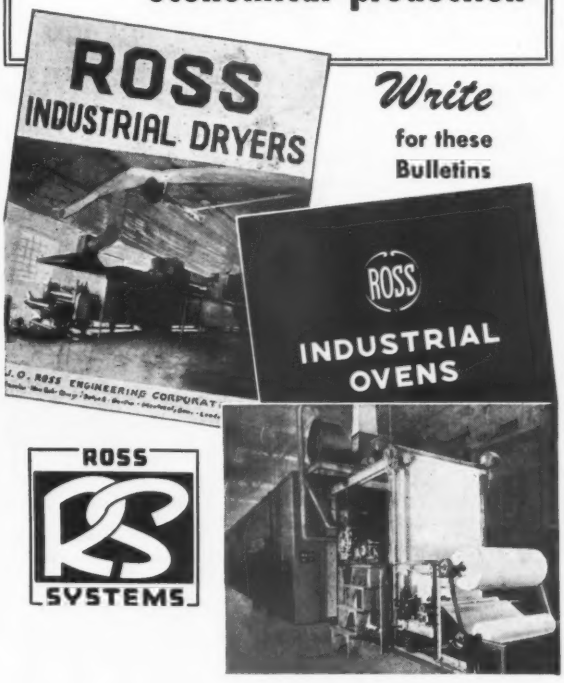

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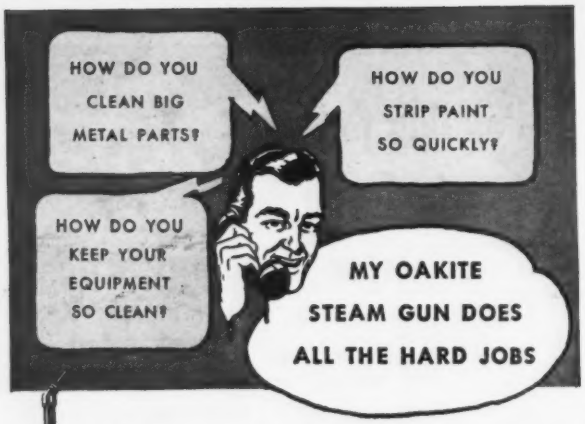
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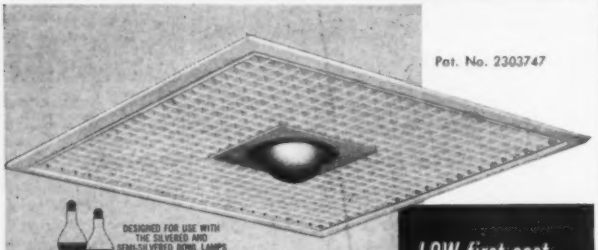

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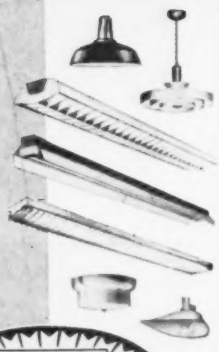

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768

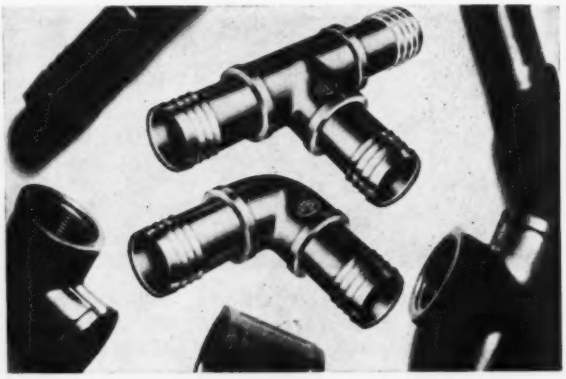
Seven speeds possible with these portable electric drills

A line of ¼-in. capacity drills, available from *Mall Tool Co.*, offers choice of free drilling speeds of 600, 800, 1,000, 1,750, 2,500, 3,500 and 5,000 rpm. Drills come in three styles: pistol grip, spade handle and center contour handle design. Ample operating freedom is gained through compact size and weight. Lightweight aluminum construction is coupled with balanced armatures and precision matched gears to reduce tiring vibrations.

769

Plastic pipe corner cutting with one fitting

These insert type ell and tee couplings facilitate making sharp turns or take-offs from flexible plastic pipe lines with one fitting where three or four are ordinarily required.



Fittings are quickly joined in same manner as usually used for insert couplings. Sections of pipe can be cut to desired length with an ordinary hand saw and fitting inserted. Stainless steel clamps are tightened over pipe and fitting to draw pipe down over serrations of insert to assure a positive leakproof joint. Manufactured by *Carlon Products Corp.*

770

Rugged, inexpensive lifting machine with 1,000-lb. capacity

Langley Manufacturing Co. is now producing the "Powr-lift," a lifting machine with a 1,000-lb. load capacity for elevating, stacking, piling and racking. This machine, which is driven by a ½-hp. reversing type motor with a drum-type controller, sells nationally for under $600, making it the lowest priced power lifting machine in the materials

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handling field. Other features include elevator type brakes, chain-lift platform. Also available in battery model. Machine lifts at 11 fpm., with fast hydraulic lowering.

771

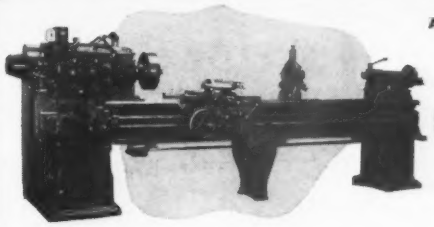
New surface grinder operates on advanced grinding principle

A grinder designed for fast and accurate generation of flat surfaces on various kinds of metal parts including cast iron, steel, die castings, plastics, ceramic parts and glass, operates on an unusual grinding principle. It consists of a cylinder-type grinding wheel mounted in a vertical plane and recessed within actual work surface of grinding table. Surfaces as wide as 9½ in., and parts of any reasonable size can be accommodated. Manufacturer is *Portman Instrument Co.*

772

Desk model folding machine

An electric office folding machine, little larger than a typewriter, can fold with precision up to 5,000 sheets an hour. It can be set up in about one minute for any folding job by means of a simple measuring rule and the adjustment of two indicator knobs. It feeds and stacks from same end, which saves working space. It can perform two parallel folds in one operation, and can make any one of eight basic types of folds, handling a wide variety of paper sizes and weights. Manufactured by *Pitney-Bowes, Inc.*



AUTHORITATIVE APPRAISALS

SINCE 1902

How Much Is This Lathe Worth

AN INCREDIBLE STORY . . . BUT TRUE

Six years ago it cost $550 second hand, reconditioning cost $400 more. A few months ago it was appraised at $4300, which the owner thought was excessive. During a discussion of the appraisal the plant burned. The insurance company paid $4300 for the lathe; it cost $6500 to replace it. "Book Values" bear little relation to insurable values in these days of rising costs. Perhaps your insurance needs revising? A General Appraisal will tell you. A discussion entails no obligation.

GENERAL APPRAISAL CO

SEATTLE 406 Marion St | PORTLAND Terminal Sales Bldg. | SAN FRANCISCO 74 Montgomery St. | LOS ANGELES 208 West 8th St.

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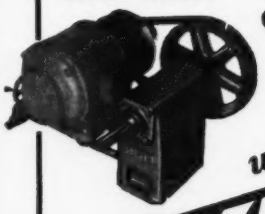
FINGERTIP SPEED CONTROL



with LOVEJOY variable SPEED PULLEYS

Speed up or slow down equipment while machines are running—make material or production changes without losing time and labor. Easily installed on old or new machines. Sizes fractional to 8 H.P. Ratios to 3:1 infinitely variable. Also investigate the new Lovejoy Tilting Motor Base. Adjustable width and length to accommodate all fractional motors up to ¾ H.P. Low Price.

FACTORY REPRESENTATIVES

Transmission Engineering Co., 6912 Santa Fe Ave., Huntington Park, California; Edward L. Parsons, 600 Sixteenth Street, Oakland 12, California; Chain Gear, Inc., 822 First Avenue, South, Seattle, Washington.

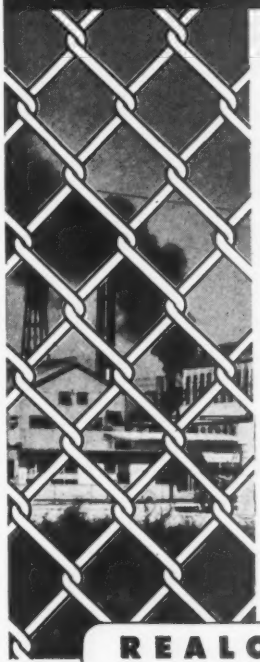
Send for catalog and complete data.

LOVEJOY FLEXIBLE COUPLING CO.

5092 West Lake Street — Chicago 44, Illinois

Also Mfrs. Lovejoy Universal Joints and Lovejoy Flexible Couplings

REALOCK FENCE



GIVES *Positive* PROTECTION

Positive protection for your grounds and property is assured with Realock Fence. In addition, all fittings, hinges and locking devices have bolts on the inside, secure from outside tampering.

Noted for its rugged construction and long-lasting weather resistance, Realock Fence can be depended upon for years of dependable, trouble-free service.

For additional information write our nearest sales office or consult your classified telephone directory.

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REALOCK FENCE

THE COLORADO FUEL & IRON CORPORATION

CF&I

BRANCHES IN ALL KEY CITIES

THE WEST ON ITS WAY

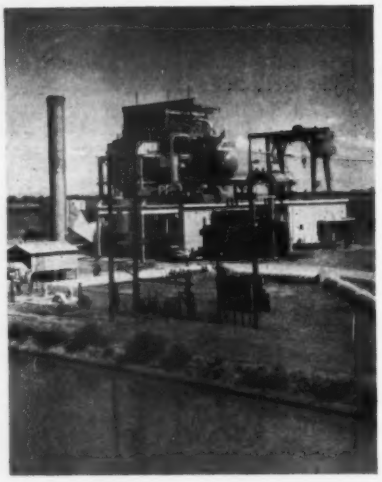
ARIZONA

ADDS VACUUM PLANT—Crystal Ice and Cold Storage Co. will add Salt River Valley's first vacuum plant for lettuce to firm's No. 6 plant west of Six Points of Christy Road. It will cost $200,000 and be in operation in time for fall shipping season. A second vacuum cooling unit is planned for Crystal's Mesa ice plant. Company is increasing food cold storage capacity of its No. 7 plant at 2106 West Christy from 60,000 to 200,000 cu. ft.

REYNOLDS GROWS—Reynolds Metals Co. plans expansion of its Phoenix operation to point where it will be one of largest plants of its type in world.

CONSTRUCTION MATERIALS ALLOTTED—National Production Authority grants materials for continuance of construction job to Capitol Foundry Co., Phoenix, steel grinding ball manufacturer. Estimated cost of project is $1,427,000.

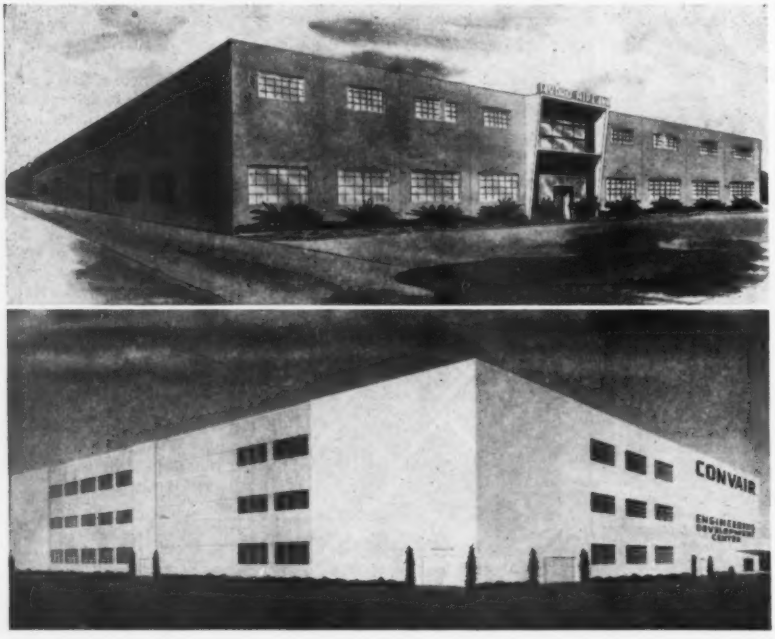
POWER PROJECT COMPLETED—Salt River Project Agricultural Improvement



and Power District puts its new $4,500,000 steam plant at Kyrene (shown above) into commercial service. Under construction for past 14 months, it is four miles south of Tempe, approximately in center of power district's service load. It is sole Arizona central station steam plant to have all major equipment, such as turbine and generator, outdoors.

HYDRO-AIRE, INC., BUILDS PLANT (upper photo)—New Burbank plant of Hydro-Aire, Inc., subsidiary of Crane Co., Chicago, will be in operation by Sept. 1, 1952. Production, uninterrupted by building program, will be increased 400% with enlarged facility. Building will house administrative offices and engineering departments as well as manufacturing area. Testing laboratory, already completed, lies adjacent to new structure.

CONVAIR BUILDS ENGINEERING DEVELOPMENT CENTER (lower photo)—Pictured is new $3,000,000 building of Consolidated Vultee Aircraft Corp.'s San Diego division. Project houses engineering and technical personnel engaged in design, research and development of aircraft, guided missiles, electronics and related products. Construction was started in June 1951 and completed last December.



CALIFORNIA

CRAG LUMBER SELLS—Crag Lumber Co., Smith River, sells its plant to National Pacific Lumber Products, Inc., of Los Angeles.

UKIAH GETS KILN—One-half million dollars will be invested by California Western Timber Products in establishing a new industrial enterprise to be known as Ukiah Dry Kiln Co., in Ukiah. Property for project has been leased there and construction begun.

JOHNS-MANVILLE EXPANSION — A major expansion of Johns-Manville Corp. plant at Watson for production of industrial insulations is planned. Building, to enclose about 100,000 sq. ft. of floor space, should be completed by early fall of 1953 and will produce about $2,500,000 of industrial products annually. Added operations will create 80 to 100 new jobs in Long Beach area.

CHRYSLER CORP. ADDS ASSEMBLY—Chrysler Corp.'s first passenger car body assembly operations on West Coast will be added to present dual civilian-defense production work of Dodge San Leandro plant. Passenger car body operation will occupy a portion of new 749,000-sq. ft. addition recently completed there. Remainder of space is being readied for production of Hamilton Standard propellers for Navy and Air Force.

RECOGNITION FOR ARCADIA—Arcadia Metal Products, Arcadia manufacturer of steel-framed sliding glass doors, achieves national recognition by its membership acceptance in Southern California chapter of Producer's Council, Inc.

CAMP BEALE TURNS TO AIR—Plans are completed for construction exceeding $6,000,000 to reactivate Camp Beale near Marysville as an Air Force training center. San Francisco architects Blanchard & Maher have finished drawings for new facilities, and contracts have been awarded for more than $4,000,000 of this work. Officials expect remainder of work to be contracted by July and construction to be completed next March. Contract goes to A. D. Schrader Co., San Francisco, for rehabilitation of railroad facilities, and to Stolte, Inc., and to Morrison-Knudsen, Oakland, goes a contract for dining and administrative facilities plus part of airmen's dormitories.

RFC GRANTS LOANS—Reconstruction Finance Corp. grants loans to following California firms under Defense Production Act: Copper Precision Products, Los Angeles manufacturer of bolts, $250,000 for expansion costs and equip-

ROLL LEADERSHIP

LARGEST OF ROLL GRINDERS INSTALLED AT MOORE'S

Because of the lack of available facilities, industrial firms in the past have been compelled to operate their rolling equipment without periodic grinding. This large addition to the other grinders now in operation at Moore's, enables them to turn out precision grinding on all size rolls.

Accommodating work up to 24-inch swing and 192 inches between centers, this huge hydraulic roll grinder will handle jobs weighing up to 10,000 pounds and with precision up to two-ten thousands of an inch tolerance.

Moore Dry Dock Company invite your inquiries and will be happy to furnish estimates on any size job, large or small.

MOORE DRY DOCK COMPANY

INDUSTRIAL MACHINERY DIVISION

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ment; Lovequist Engineering Co., Los Angeles aircraft parts producer, $140,000 for machinery and equipment.

MOORE PAINTS FOR WEST—Benjamin Moore & Co., New York paint, varnish and enamel manufacturer, establishes a West Coast factory in Los Angeles.

FIBER GLASS BUYS "GARAN FINISH"—Fiber Glass Division of Libbey-Owens-Ford Glass Co. purchases "Garan Finish," a surface treatment applied to glass fibers for reinforcing plastics, from Garan Chemical Corp., Los Angeles. Purchase includes all patent properties, goodwill associated with trademarks "Garan" and "Garan Finish," plus acquisition of certain technical services of Dr. Robert Steinman.

SOLAR GRANTS BRITISH LICENSE—Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif., issues first British license for use of Sol-A-Die method of producing complex sheet metal shapes to Rolls-Royce Ltd., Derby, England.

WULFF ACETYLENE PROCESS ADOPTED—Wulff Process Co., Maywood, enters into agreement with three companies including Fluor Corp., Ltd., Los Angeles, under which these companies may design and construct plants for applications of Wulff process for making low-cost acetylene and ethylene. Process, applicable to production of ethylene or simultaneous production of acetylene and ethylene, may be used in plants manufacturing from one to one hundred tons daily.

RYAN GETS AEROJET CONTRACT—Aerojet Engineering Corp. awards contract for production of missile motor components of recently developed Aerojet type to Ryan Aeronautical Co., San Diego, specialists in fabrication of high-temperature metals.

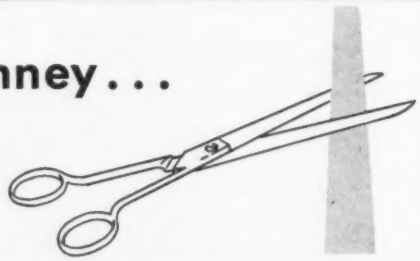
COLLINS JOINS GAINES—Robert H. Collins, formerly of Omaha, Neb., becomes full partner in Gaines Co., Los Angeles, manufacturer of permanent mold casting of aluminum and magnesium, and changes company name to Gaines-Collins Co. Gaines-Collins plans doubling plant capacity, adding new equipment, and has acquired, as part of its expansion, Quijada Tool Co., Inc., Los Angeles.

APEX SMELTING EXPANDS WESTWARD—Apex Smelting Co., 2537 West Taylor St., Chicago 12, Ill., acquires 20 acres within Los Angeles industrial area where it will construct a plant expected to be producing aluminum alloys by late fall. When completed, plant will also put out magnesium alloys and zinc base die cast alloys.

CAL-MODE AND CHAIRCRAFT MERGE — Two Los Angeles furniture manufacturers, Cal-Mode and Chaircraft, merge plant facilities and sales forces. They will remain two corporations, but both will operate out of 35,000-sq. ft. plant at 5959 South Western Ave., occupied by Cal-Mode for past six years.

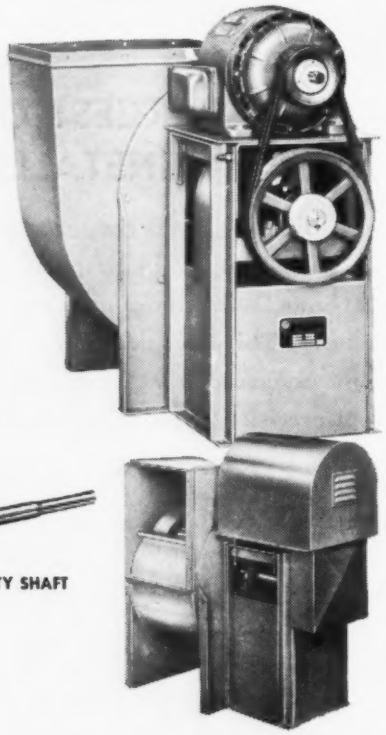
NPA APPROVES CERTIFICATES—National Production Authority gives certificates of necessity for defense plant expansions to following firms with project named and amount certified: McCulloch Motors Corp., Los Angeles, aircraft components, $584,348; Pacific Gas & Electric Co., East Palo Alto, electric power, $545,118; Tug Sea Cloud, Inc., San Francisco, water transportation, $250,000; Tug Sea Breeze, Inc., San Francisco, transportation, $250,000; Robertshaw-Fulton Controls Co., Anaheim, aircraft components, $828,678; Douglas Aircraft Co., Inc., Santa Monica, airplanes and parts, $3,915,307; Mechanical Specialties Co., Los Angeles, tools, dies and jigs, $152,551; Duplicate Parts Co. and Standard Tool and Die Co., Los Angeles, drill, fixtures and dies, $144,640; Douglas Aircraft Co., Santa Monica, aircraft and parts, $150,053; Douglas Aircraft Co., El Segundo, aircraft and parts, $184,267; Douglas Aircraft Co., Inc., Long Beach, airplanes, $40,000; Standard Oil Co. of Calif., Richmond, petroleum products, $1,001,600; Union Oil Co. of Calif., Wilmington, motor polymer, $1,512,000; Union Oil Co. of Calif., Wilmington, motor polymer, $488,000; Shell Oil Co., Martinez, gasoline, $242,000; Union Oil Co. of Calif., Contra Costa County, transport facilities, $270,000; Douglas Oil Co. of Calif., Paramount, gasoline, $203,991, $128,592, and $33,000; Lovequest Engineering Co., Los Angeles, aircraft parts, $141,053; Chicksan Co., Brea, aircraft parts, $78,398; Lockheed Aircraft Corp., Palmdale, aircraft.

Cut the chimney...



out of your boiler installation plans!

The INDUCED DRAFT BLOWER is eliminating the need for tall, expensive chimneys in many modern boiler installations today. The breeching is connected to the inlet of the blower, and a short stack from the blower discharge carries the waste gases outside. The blower creates all the draft needed to keep the hot gases moving through the boiler passages or flues. It starts and stops with the burner, eliminating waste of heat when burner is off. A damper in the breeching can be used to adjust the volume of moving gases. The blower is of Class II construction with heat slinger and bearing cooling fan to withstand flue gas temperatures. Blower, motor and drive are a self-contained unit ready for installation at the boiler site.



STANDARD HEAVY DUTY SHAFT

STANDARD SELF-ALIGNING BALL BEARING

If blower is installed outdoors or on the roof above the boiler house, it can be equipped with a weatherhood to protect the motor and drive.

MASTER FAN CORP.

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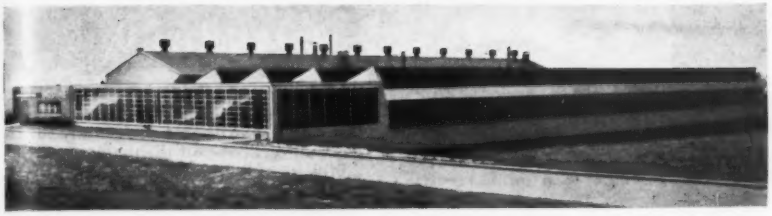


CONVECTOR MANUFACTURE FOR COAST—Modine Manufacturing Co. will start large-scale production of convector radiators at its Whittier plant in August.

$400,000; Union Oil Co. of Calif., Wilmington, benzene and toluene, $2,950,000, $6,663,000, and $2,387,000; Tide Water Associated Oil Co., Avon, gasoline, $350,000 and $850,000; Rockwell Mfg. Co., Oakland, valves, $1,164,368; Morrison Engineering Co., Rancho San Franciscito, aircraft parts, $79,302; Douglas Aircraft Co., Bell, airplane parts, $52,533; Douglas Aircraft Co., Santa Monica, airplane parts, $134,759; Standard Oil Co. of Calif., San Francisco, oil transportation, $5,250,000; Imperial Land and Cattle Co., Calipatria, cotton gin, $109,500; Douglas Aircraft Co., Long Beach, airplanes and parts, $243,803; Pacific Gas & Electric Co., Kings County, power, $211,875; Honolulu Oil Corp., Taft, gasoline, $144,827 and $53,172; Lockheed Aircraft Corp., Burbank, aircraft, $317,647; Mult-Shel Co., Glendale, aircraft parts, $154,900; Union Pacific Railroad, Los Angeles, transportation, $2,800,000; Bermile Powder Co., Saugus, ordnance, $80,000; Deutsch Co., Los Angeles, aircraft parts, $106,521; Tank Barge 16, Inc., San Francisco, water transportation, $375,000.

DRAYER-HANSON BUYS PLANT—Jackson Engineering Co., Los Angeles, maker of aerial coolers and shell and tube heat exchangers for petroleum and chemical industries, sells out to Drayer-Hanson, Inc., manufacturer of refrigeration and air conditioning equipment. Gordon M. Jackson, president of Jackson Engineering, joins Drayer-Hanson as vice president of industrial division. His experience will be used in manufacture of helically-wound finned tubing. Division will continue producing all former Jackson products.

ORE LOADING MACHINE—Pomeroy Construction Co. of San Francisco is building a $250,000 bulk ore loading machine for Port of Stockton geared to load bulk ore into ships at rate of 1,000 tons per hour. Mechanism is being initially constructed for Stockton Bulk Terminal Co.

McCLELLAN BASE FOR EXPANSION—U. S. Army Corps of Engineers plans a $20,000,000 building program for McClellan Air Force base in North Sacramento. First units will be ready for use in February with transportation control depot facilities scheduled for completion by May of 1954. Work will add 510 acres of land to present base and include railroad spur trackage, warehousing, oil storage, salvage area and a vehicle processing building.

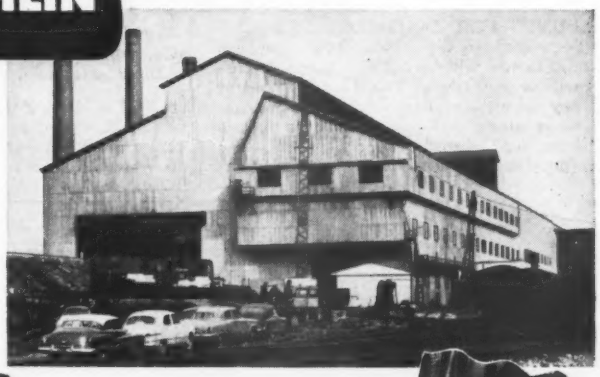
LOCKHEED WILL BUILD—Lockheed Aircraft Corp., Burbank, Calif., plans construction shortly of a $1,300,000 factory for final assembly of F-94 jet interceptors at proposed jet center of Air Force in Palmdale. Upon completion of project, about March 1953, Lockheed will move assembly lines and F-94 component airframe parts from Burbank plant B-1. In addition to 180 to 240-ft. F-94 unit, a 180 by 400-ft. extension is contemplated later to accommodate a possible switch of T-33 jet trainer final assembly from Van Nuys to Palmdale by end of 1953.

RAISIN OPERATIONS INCREASED—Rosenberg Bros. & Co. of San Francisco have $500,000 modernization program for firm's raisin plants with long range goal to have all packing operations concentrated in Fresno plant on Orange Ave., Fresno, where a 63-acre site and 200,000 sq. ft. of floor space is available.

CHANSLOR AND NICE MERGE—Chanslor & Lyon-Palace Corp., San Francisco, and Nice Ball Bearing Co. of

JONES and LAUGHLIN CHOOSES Plasteel

PLASTEEL—Chosen for part of New Otis Works buildings which house J&L'S new open hearth furnaces and will help increase production in Cleveland by 200,000 net tons annually.



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PLASTEEL speeds erection! It's light in weight, easy to handle, requires no skill. Best of all, PLASTEEL prolongs the life of your buildings. *Mica makes the difference!* It prevents deterioration! Adds protection! Insulates! Beautifies!

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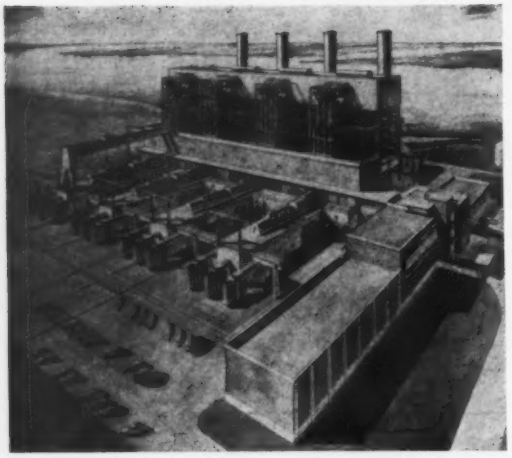


BIG NEW PLANT FOR PG&E—Sketched is Pacific Gas and Electric Co.'s steam-electric plant being built near Pittsburg. Eighty million dollar, 800,000-hp. capacity project is California's largest generating installation.

Philadelphia, Pa., consolidate through exchange of stock. Share holders of Nice Ball Bearing will receive 1¼ share of Chanslor & Lyon-Palace common stock for each share of Nice.

PUMPS FOR SOUTHERN CALIF. — Metropolitan Water District of Southern California will install two pumps, each with a capacity of 90,000 gal. of water per minute, at five main pumping stations along 457-mile aqueduct system bringing Colorado River water into Los Angeles and 44 other cities. With increase in capacity, Metropolitan Aqueduct will be able to deliver up to 650,000,000 gal. of Colorado River water daily to serve over 4,000,000 people. Contract cost of pumps is $1,548,620. Four pumps each are being supplied by Worthington Corp. and Byron Jackson Co., while Allis-Chalmers Manufacturing Co. supplies two.

ANOTHER CUP OF COFFEE—General Foods Corp. awards Swinerton & Walberg Co. a contract for a major addition to Maxwell House plant at San Leandro.

COLORADO

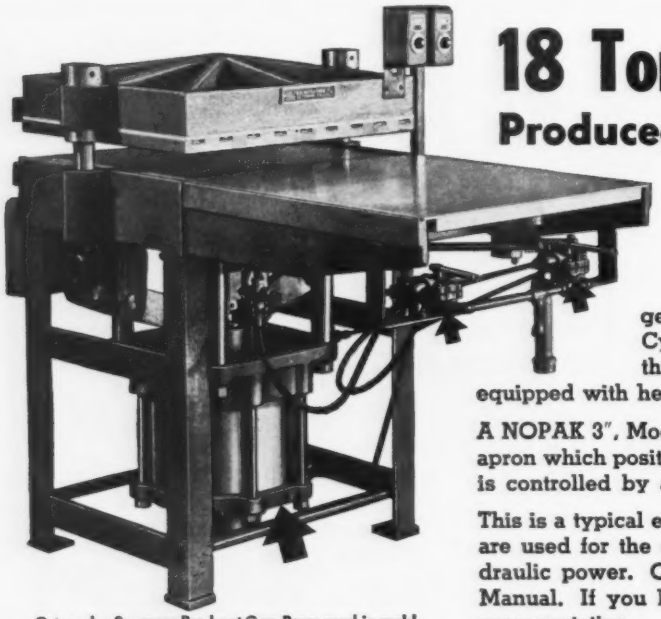
SAN LUIS VALLEY GETS PRODUCING WELL — Snowden-Thomas test well, three miles northeast of Center, forces gas and distillate oil through more than 2,000 ft. of water to give proof of substantial underground wealth in San Luis Valley.

IDAHO

TRIPLE SUPERPHOSPHATE PLANT FOR POCATELLO—J. R. Simplot Fertilizer Co. will build a $2,500,000 triple superphosphate plant west of Pocatello adjoining present single superphosphate plant. Factory is scheduled to go into production by late fall.

APACHE MINES SOLD—In a transaction involving about $2,000,000, Elmer G. Taylor of Boise takes over Apache mines near Hailey. Group consists of 83 proved claims on zinc, lead and silver and gold ground, and a selective flotation mill with 150-ton daily capacity now in operation.

PHOSPHATE PLANTS POSSIBLE—Pacific Supply Cooperative, Walla Walla, Wash., and Central Farmers Fertilizer Co., Chicago, stand ready to build Idaho phosphate fertilizer plants totaling $30,000,000 if Hells Canyon Dam on Snake River is built providing cheap power.



Ostrander-Seymour Pre-heat Gap Press used in molding All-Plastic Printing Plates. Arrows indicate position of 14", Model "C" NOPAK Cylinder and 2 NOPAK 4-Way Valves. (The 3" NOPAK Cylinder is not visible).

18 Ton Platen Pressure
Produced by NOPAK Cylinder

This Pre-heat Gap Press is designed and constructed expressly for the efficient molding of All-Plastic Printing Plates . . . by the Ostrander-Seymour Company of Chicago. 18 Ton Platen Pressure is generated by a 14" NOPAK Model "C" Air Cylinder, working at 100 P.S.I. line pressure, through toggle leverage. The upper platen, equipped with heating coils, is pulled down onto the work.

A NOPAK 3", Model "E" Cylinder operates the sliding, loading apron which positions the work under the platen. Each cylinder is controlled by a NOPAK ⅜", 4-Way Hand-Operated Valve.

This is a typical example of how NOPAK Valves and Cylinders are used for the efficient application and control of air or hydraulic power. Others are shown in the NOPAK Application Manual. If you haven't seen it, write or ask your NOPAK representative.

GALLAND-HENNING MFG. CO., 2749 S. 31st St., Milwaukee 46, Wis.

Refer to Sweet's File for Product Designers, or write for Bulletin SW-1.

Representatives in Principal Cities.

NOPAK
VALVES AND CYLINDERS
DESIGNED for AIR and HYDRAULIC SERVICE

A-7212-½-H

MONTANA

KLEIN MINE CLOSED—Because of decreased demand for coal, Milwaukee Railroad closes its Klein coal mine No. 2 near Roundup, a 1,800-ton daily producer.

ANACONDA ACQUIRES ALUMINA—Anaconda Copper Mining Co. contracts for a supply of alumina with Reynolds Aluminum Co. for its proposed $46,000,000 aluminum plant near Kalispell. ACM and Harvey Machine Co. proposed plant will produce 54,000 tons of aluminum ingots yearly.

STEAM-ELECTRIC PLANT PLANNED—Montana-Dakota Utilities Co. purchases 125 acres three miles northeast of Mandan as expansion site of its steam power generating facilities. Construction of new plant should start shortly. Initial operation will call for use of over 1,000 tons of lignite coal daily, doubling as conditions permit plant enlargement.

NEVADA

CONSTRUCTION MATERIALS ALLOTTED—National Production Authority grants materials for continuance of construction jobs to Hercules Powder Co., Henderson, producer of toxaphene for $1,989,120 project and to Western Electrochemical Co., Henderson, parchlorates producer, for a $3,597,000 project.

BMI SALE COMPLETED—Sale of state-owned Basic Magnesium plant at Henderson to firms formerly leasing these facilities is now complete. R. Julian Moore will retain his position of manager under new private ownership.

AUTOTYPE PLANT FOR FERNLEY—Autotype Co. makes ready to move its Oakland plant to Fernley in order to take advantage of state's "free port" act. Company, manufacturing rough castings in its Eastern home plant, plans to warehouse and do nickel plating at Fernley and supply West Coast points from Nevada.

NEW FERTILIZER INDUSTRY DEVELOPED—Tri-State Organo Co. hopes to start a plant for processing waste material into fertilizer in Reno. A possible "organo" factory would process about 900 tons per month and employ 25 to 30 workers.

ELECTRO-METALS PLANS PLANT—Electro-Metals, Inc., plans construction of an electrolytic zinc reduction pilot plant near Henderson. Ore to be treated at new facility will be mined at zinc properties in Goodsprings area of Clark County. Pilot plant, designed to produce some 15 tons of zinc dust daily, may be expanded into a unit with daily output of 100 tons of zinc dust and 35 tons of high grade lead.

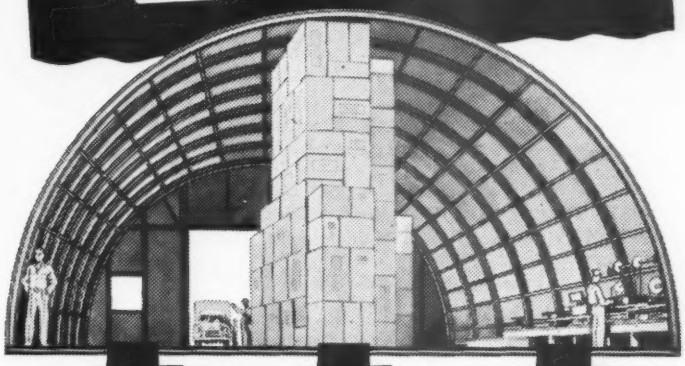
NEW MEXICO

ICE PLANT FOR GRANTS—Grants Ice and Development Co. builds a $250,000 ice plant at Grants to serve vegetable

WHY pay for space you can't use?

QUONSET

gives you FULL USE of ALL interior space!



To fully realize its overall roominess, look INTO a QUONSET 40, a 6-foot man can stand erect within 12 inches from the side wall.

One extraordinary feature of QUONSET is the clear span which allows full use of ALL inside space. A Quonset 40 allows vertical storage to 20 feet.

Work benches, mechanical equipment, etc., fit ideally along the side wall of a QUONSET. Picture your requirements INSIDE a QUONSET.

- QUICK AVAILABILITY
- SPEEDY ERECTION
- EARLY OCCUPANCY

The exclusive "nail-to" feature of STRAN-STEEL framing which is used in the QUONSET, permits any collateral material to be nailed directly to the framing members without the necessity of extra, expensive furring. All-over QUONSET construction affords easy expandability to any width or any length. Investigate ALL the advantages of QUONSET for *your* industrial building.

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RIGHT ANGLE and "FLANG-LOK"

EXPANSION JOINTS

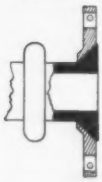
Every factor involved in the building of Goodall Expansion Joints contributes to maximum efficiency, durability and safety under all service conditions. Specifications for their component parts are dictated by long experience in making these products; and factory specialists apply their skill to every detail of construction.

THREE TYPES—"Flang-Lok," Right Angle and Sleeve.
FIVE STYLES—Single Arch, Multiple Arch, Tapered, Offset and Rectangular.
ALL SIZES—From ⅜" I.D. to 96" I.D.

Uses: To eliminate the costly effects of expansion and contraction in metal pipe lines and other equipment; to counteract vibration; to insulate against undesirable sound; and to correct for misalignment. *Under pressure, vacuum or both,* they will withstand repeated flexing, with the highest resistance to cracking and "setting."

For Handling: Water, air, oil, brine, acids, alkalies, gases, gasoline, refrigerants, tar, molasses and many other substances, at temperatures up to 250° F. Construction determined by service requirements.

"FLANG-LOK" MEANS EASIER INSTALLATION



The combination of "Flang-Lok" End Expansion Joints and "Flang-Lok" Floating Flanges assures quick, easy installation even in extremely "close quarters." It is only necessary to turn the flange (not joint or pipe) to align bolt holes with connecting flange. As flange bolts are tightened, rubber end of joint is compressed over a broad area of connecting flange, providing a leak-proof seal having the widest margin of safety against rated pressures.

"Flang-Lok" Flanges are of cast iron or steel, and drilled to conform to A. S. A. drilling templates in 1" and larger. They are split type, with segments readily bolted together over end of joint, in preparation for actual connection. Flanges up to 24" pipe size are made in two sections; from 30" to 96", in four sections. Design covered by U. S. Pat. No. 1883086 and No. 2395144.

PARTICIPATING IN THE MANAGEMENT AND FINANCING OF KENTUCKY SYNTHETIC RUBBER CORPORATION

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Est. 1870

growers and shippers of Bluewater Valley. Plant, designed by William W. Ellison, Albuquerque architect, measures 100 by 200 ft. It will have a 200-ton daily output of ice and will include a locker plant as well as cold storage facilities for interstate shippers of frozen foods.

ANACONDA URANIUM LEASE APPROVED — U. S. Indian Bureau approves Anaconda Copper Mine Co.'s lease of 800 acres at Laguna Pueblo near Albuquerque for uranium mining. Lease is good for ten years and as long thereafter as uranium is mined in paying quantities.

OREGON

RFC GRANTS LOANS—Reconstruction Finance Corp. grants loans to following Oregon canneries: Lamb-Weston, Inc., Weston, $1,000,000 for working capital; Kolstad Canneries, Inc., Silverton, $200,000 for working capital.

HARDBOARD PLANS FOR SWEET HOME—Willamette Fibre Products Co. plans on building a $1,500,000 hardboard plant in Sweet Home. Construction will start this fall. Mill will use about 60 cords of scrap wood and bark daily to be drawn from seven sawmills in area. Incorporators of new firm are John Tyner and Hobart McQueary, both of Sheridan.

APEX TO USE OREGON CLAYS—Apex Smelting Co., Chicago, plans a commercial pilot plant for production of intermediate alloys containing aluminum and silicon. Facility, to be built in Eugene area, will use local clays in its reduction operations.

WEYERHAEUSER TAKES OPTION—Weyerhaeuser Timber Co. takes option to sublease an alcohol-from-wood waste plant erected in Springfield by government at close of World War II. If plant is subleased, move will mark company's first venture into wood chemical field.

TRANSPORTATION CONTRACTS—Gunderson Bros. Engineering Corp., Portland, is awarded a $540,160 contract for two 120-ft. refrigerated cargo barges for Bureau of Ships, U. S. Navy. Albina Engine & Machine Works, Portland, will build two 235-ft. gasoline barges on a $395,486 contract. Portland Tug and Barge Co. receives a $123,000 contract from Navy for construction of two 250-ton covered lighters.

UTAH

OIL FROM SANDSTONE—Bureau of Mines reports that most of heavy crude oil content bitumen of bituminous sandstone in Utah can be recovered and refined into motor gasoline and other products. Two deposits, near Vernal and Sunnyside, contain at least 2,000,000,000 barrels of bitumen or equivalent to about 40% of original petroleum reserve in East Texas oil field, nation's largest.

RECOVERY PROCESS — Howe Sound Mining Co.'s $2,500,000 cobalt refinery near Salt Lake City, to be completed this summer, will use one of Chemical Con-

struction Corp.'s newly discovered metal reduction processes predicted to sharply trim ore and scrap extraction costs. New plant will boost world output of cobalt by over 40% and will daily process 35 tons of 20% cobalt concentrates from Howe Sound's Blackbird mine near Cobalt, Idaho.

WASHINGTON

ALUMINUM INDUSTRY EXPANDS—Western Aluminum Corp. expands its headquarters at 3318 Fourth Ave. South, Seattle, to involve production of roofing, gutters, foil and other home, farm and industrial equipment. Plant facilities installed and in process of being added will total about $1,500,000, and include an overhead electric crane system, three rolling mills, foil spooling and trimming machines, dies and punch presses, an annealing furnace, and complete machine shop facilities with planer and lathes. Eventual plant capacity of Seattle operation will reach 45,000,000 lb. of various sheet and foil gauges.

DAIRY DEAL MADE — Consolidated Dairy Products Co., Seattle, buys Alpine Dairy properties for $2,600,000. Properties include Issaquah Creamery and Alpine Dairy at 4058 Rainier Ave., Apex Farms with offices at 3 W. Cremona St., and Finstad and Utgard, Inc., a dairy at Conway. Hans Forster remains as manager of properties.

TUNGSTEN MINE WILL REOPEN—Border Lord Mining Corp., Seattle, leases "German tungsten mine" in western Okanogan County and plans immediate reopening. Trioxide-tungsten concentrates produced from mine will be sold to U. S. government. An airlift will be used to fly in supplies to Okanogan and to remove concentrates.

PLYWOOD PLANT OPENS AGAIN—Sylvan Products, Inc., resumes operations at its Centralia plywood plant after being closed since late December. Firm plans sheathing plywood production only for time being.

LUMBER CO. CHANGES HANDS—Walton Lumber Co. mill in Centralia is purchased by Centralia Lumber Mill, Inc. Carl M. Frantz, Jr., John W. Garrick and Harold L. Davidson, all of Portland, Ore., have filed incorporation papers for Centralia Lumber with a capitalization of $50,000.

NEW NAME of Seattle Chain & Manufacturing Co., Seattle, is Round Seattle Chain Corp. Name was changed so that it will be more closely identified with parent company.

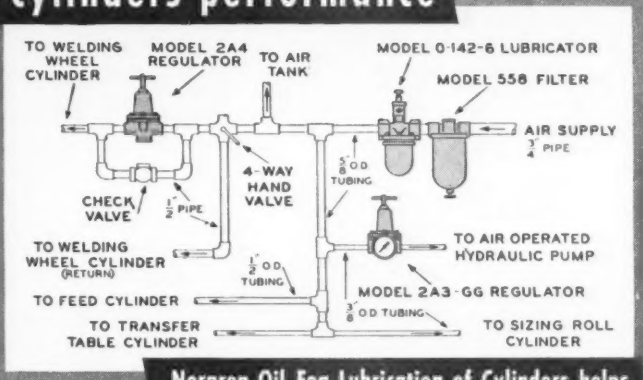
NATURAL GAS MARATHON—Seattle Gas Co., which would be one of principal distributors of natural gas from Canada, refuses a "letter of intent" to Westcoast Transmission Co., which to date is leader in race for exporting approval from Canadian authorities, and announces that it now is depending upon Pacific Northwest Pipeline Corp. to bring gas from the "four corners" area of New Mexico, Arizona, Colorado and Utah. Gas companies serving other Washington cities are following suit. Westcoast has its application to export natural gas from Peace River district in northern Alberta approved by Alberta government, and Canadian federal transport board gives conditional approval of provincial action, subject to board's finding that reserves are sufficient. Seattle Gas Co. also cancels a contract with Northwest Natural Gas Co., which proposed bringing gas from Pincher Creek field in southwestern Alberta, a much larger source of supply.

WYOMING

DRILLING WILL FIX SULPHUR SITE—Size and location of General Petroleum Corp's proposed sulphur extraction plant at Manderson will be determined by exploratory drilling activity during coming months. Plant, to be used primarily for extraction of sulphur bearing gas, will also produce gasoline, butane and propane gas. Exploratory drilling will show availability of oil with a high sulphur content and will determine capacity of installation.

GAS FROM COAL AT PROFIT—Ebasco Services, Inc., a New York management engineering firm, reports to U. S. Department of Interior that gasoline can be produced at a profit by hydrogenation of coal. If 11 cents a gallon were charged for gasoline produced, and revenues from chemicals and other by-products were considered, a small profit could be realized. According to a market study, by-products could be effectively marketed by 1955. Firm estimates $403,827,000 as capital investment required in a hypothetical plant at Rock Springs, Wyo.

NORGREN improves air cylinders performance



Norgren Oil Fog Lubrication of Cylinders helps National Welder attain 1000-per-hour Output

PLANT REPORT
NATIONAL ELECTRIC WELDING MACHINES CO.

PROBLEM: To provide positive, trouble-free lubrication of 4 air cylinders and one air-operated hydraulic pump for a special 200 KVA Welder which automatically roll-forms, sizes, feeds and mash-seam welds metal containers up to 25" in diameter.

SOLUTION: Use of Norgren Filter, Regulator and Lubricator system which cleans, regulates and lubricates the air used to power the pneumatic units on the Welder.

RESULT: The Norgren equipment provided the efficient, dependable lubrication, air regulation and air cleaning required for continuous high speed operation— thus saves time and money for the National Welder users by reducing maintenance and costly down time, and minimizes the amount of servicing by the manufacturer. National Electric Welding Machine Company says: "We have standardized on Norgren air accessories for nineteen years and have found them to be extremely satisfactory."

- Hose Assemblies
- Regulators
- Valves
- Filters

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Gentlemen: Please send me your free Norgren Blueprint No. 115-A, giving complete data on above lubrication system.

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Address_____
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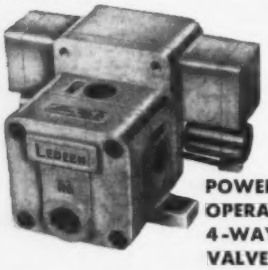
GET THE MOST OUT OF YOUR CYLINDERS with Ledeen VALVES

HAND OPERATED 4-WAY VALVE

Three models: Completely Manual—Spring Return to Neutral—Spring Return to Reverse. Flow cycles to handle most requirements.

FOOT OPERATED 4-WAY VALVE

Same as Hand Operated Valve, except foot operation replaces hand. Leaves hands free for other work.



POWER OPERATED 4-WAY VALVE

For remote control, safety or automatic equipment. Suitable for solenoid, cam, finger, toe or hand operation.

Ledeen valves are built in sizes from ⅛" to 1¼" standard pipe tap—to operate air and hydraulic cylinders and motors, single and double acting.

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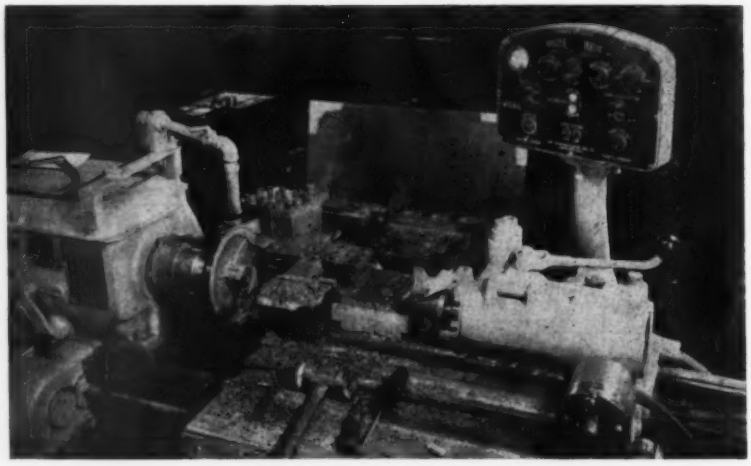
DIAMETERS automatically maintain CUTTING SPEED



PRODUCTION on a Monarch Keller Magna-Matic lathe at Sterling Electric Motors, Inc., Los Angeles, is increased 40% by installation of one of their level controlled Speed-Trol Infinite Variable Speed Electric Power Drives.

The lathe is used for turning and facing their Speed-Trol variable pitch pulleys. This unusual application of variable speed makes possible maximum machine output by providing automatic, continuous adjustment of spindle speed so that cutting speed can be uniformly held at 375 ft. per minute over changing diameter of the pulley face. This comes by a direct linkage from the machine cross slide to the speed adjustment lever on Speed-Trol.

Here is a good example of correct application of variable speed to machinery and equipment increasing production, improving product quality and reducing costs.

Aircraft employment hits new high

CALIFORNIA AIRCRAFT plants have added more than 50,000 workers to their payrolls over the past year and more than 100,000 workers over the past two years reaching a new postwar high in May 1952 of 184,500 wage and salary workers.

This is an increase of 41% above the year-ago total of 131,300 and more than 2-1/3 times the May 1950 figure of 78,000. Present total is 54% of the wartime industrial peak established in August 1943.

In terms of employment, aircraft is California's largest single manufacturing industry, employing 20% of the total manufacturing work force this May and 30% of all workers in durable goods plants.

Most aircraft manufacture in California is concentrated in the Los Angeles and San Diego metropolitan areas. Los Angeles aircraft employment reached 143,900 in May, 40% above that of May 1951 and more than twice the May 1950 figure. One out of every four Los Angeles manufacturing workers is employed in an aircraft plant.

San Diego aircraft employment rose to 39,100 in May compared to 27,800 a year ago. This is more than 3-1/3 times the number employed in May 1950. Aircraft plants employ nearly four out of every five San Diego manufacturing workers.

Can it compete?

WOOD SUGAR MOLASSES can be used to advantage as a feedstuff for laying hens, poultry scientists at the Oregon State college agricultural experiment station report. The trials with laying hens are part of a series conducted by the station to determine the value of good sugar molasses, made from Douglas fir wood wastes, for future use as animal feeds. Earlier tests with dairy cattle, swine and sheep produced favorable results also.

Will a chemical tail wag the lumber dog?

"IN THE PAST two years, 400,000,000 board feet a year of one-time waste from sawmills and plywood plants have been converted into the basic ingredient for the eleven large kraft paper mills in the Northwest. Within another two years 700,000,000 board feet of waste will be thus used annually to supply over 70 per cent of the needs for this kraft paper industry."

So stated Hillman Lueddemann, president of the West Coast Lumbermen's Association, vice president and general manager of Pope & Talbot, Inc., and vice president of the Pacific Northwest Trade Association, at a recent Association conference.

He warned that Northwest industry, especially lumber and plywood manufacturers, must take the lead in sponsoring and promoting this new chemical development or they may find themselves in the very near future competing for logs with a chemical industry financed and managed by industrialists from other regions who are presently eyeing this region's vast resources.

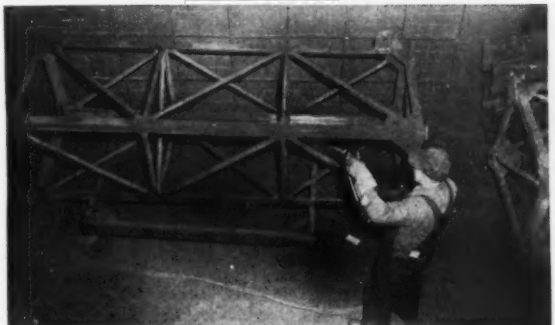
There's a real shortage of reels and spools

BIG REELS OR SMALL, they are hard to come by, and wire and cable makers can use any you may have on hand to meet the shortage. Drum-type reels are made of rolled steel, flanges generally of spruce which must be seasoned lest joints open up. Older reels and spools "stranded" on back lots of wire and cable users are therefore more dependable than new ones and should be put to work. Take another check out back and return your "empties." You will have faster deliveries on orders placed with your manufacturer.

McGraw-Hill Publishes Book On Statistical Methods

The McGraw-Hill Book Co. publishes "Industrial Process Control by Statistical Methods," by John D. Heide. Designed specifically for manufacturers who do not have available the regular services of a statistician, this guide explains basic statistical concepts and shows how to apply statistical methods to control manufacturing processes directly. It explains basic arguments that underly statistical distribution, then relates them to factory process variation, and in nontechnical terms shows how various control charts are developed from distributions. Emphasis is on practical applications. Price of book is $6.00.

WHO SAID PAINT OVERSPRAY REMOVAL WAS A PROBLEM?



This R-P Paint Arrestor Installation is Economical, Effective. Requires a Minimum of Floor Space.

A wall of R P Paint Arrestors and a blower solved the manufacturer's paint overspray removal problem in painting sections of structural steel in the installation above. Versatile R P Paint Arrestors can be the most economical solution for your plant, too.

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WESTERNERS AT WORK

Arizona

C. R. KUZELL, who was assistant general manager of Western Operations for *Phelps Dodge Corporation* for a number of years during the incumbency of the late H. M. LAVENDER as vice-president and general manager, is now general manager of Western operations. W. C. LAWSON, formerly assistant to the vice president and general manager, has moved up to Mr. Kuzell's old spot.

California

WILLIAM G. VAN BECKUM, Manager of technical services and assistant sales manager of the special products division of *Weyerhaeuser Timber Company*, appointed director of research for *Pacific Lumber Company*, San Francisco, largest operator in the redwood field.

LLOYD R. EARL, formerly vice president of *Consolidated Western (U. S.) Steel Corp.*, is elected president of *United Concrete Pipe Corporation*, Baldwin Park.

Wage Stabilization Board, Washington, D. C., makes three appointments to industry delegation on Wage Board for California-Arizona-Nevada region. PEMBROKE GOCHNAUER, San Francisco attorney, is named an industry member; ROBERT GRUNSKY, managing director of *California Metal Trades Association*, and BRUCE MCKENZIE, executive assistant to industry delegation of Regional Board since Oct. 1951, are alternates. ELIZABETH MORRIS, industrial wage analyst, succeeds McKenzie as executive assistant to industry delegation.

GEORGE C. FORD, formerly general manager of *Norris-Thermador Corp.'s* Riverbank plant, becomes vice president in charge of manufacturing for Norris-Thermador, Los Angeles.

George C. Ford

DR. D. P. STEVENSON is promoted to head of Physics department at *Shell Development Co.*, Emeryville, Calif. He has been an assistant department head since 1950. DR. J. N. WILSON, previously in charge of Physics department, now heads Shell Development Co.'s catalysis and surface chemistry department.

PALMER W. GRIFFITH, West Coast technical sales director of *American Cyanamid Co.*, receives eleventh annual John Wesley Hyatt award for achievements of importance to plastics industry.

EZRA MOSHER, formerly resident engineer of *National Seal Co.*, subsidiary of *National Motor Bearing Co., Inc.*, at Van Wert, Ohio, is named chief research engineer of parent company, Redwood City, Calif.

J. T. BERGER is appointed director of industrial relations for *Pacific Airmotive Corp.* His headquarters are at company's home office in Burbank, and responsibilities extend to all branch locations. MRS. CHARLOTTE DE ARMOND, formerly advertising manager of *Gladding, McBean & Co.'s* Franciscan division, becomes director of public relations for Pacific Airmotive Corp.

OLIVER DE PEW, JR., is made general manager of Pioneer Furnace Co., Los Angeles.

JOHN F. DAVIDSON is appointed assistant general manager for *California Eastern Airways, Inc.*, Oakland division.

hand pushed TROLLEYS

SIDE ROLLERS ASSURE EASY OPERATION AND LOW WEAR ON CURVED TRACK

P-2633
1 Ton Capacity
6"-15" I-Beam

Webb *Hand Pushed Trolleys* are versatile, simple, economical, effective. Drop-forged, hardened wheels assure long wear; ball bearings and side-guide rollers make them very easy to push. Write for *Hand Pushed Trolley* Bulletin and prices.

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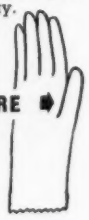
These new rough and tough Surety TRIPL-PALM GLOVES have an extremely heavy synthetic rubber coating on the palm where the greatest resistance to wear and abrasion is needed most—yet, they are soft and pliable for hand comfort. On any job where there is extreme abrasive action—TRIPL-PALM GLOVES will outwear, by many times, the usual coated glove.

All styles available from your jobber or write today.



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H. A. MAC INTOSH—Sales Representative
WESTERN DIVISION
544 MARKET STREET, SAN FRANCISCO 4, CALIF.

Gladding, McBean & Co. makes new managerial assignments as follows: A. LEE BENNETT, vice president in charge of research and development; JAMES W. MAHONEY, vice president in charge of sales; and WILLIAM F. CODEJOHN, vice president in charge of production. Foregoing officers will headquarter at company's general offices in Los Angeles.

G. W. KELLY, purchasing agent of *Kaiser Steel Corp.*, Oakland, Calif., is named general purchasing agent in full charge of all purchasing activities for company's mines, mills and offices. He will continue to maintain offices in Oakland. R. L. LAMBORN, scrap procurement manager at Los Angeles, is being transferred to home office in Oakland as purchasing agent. W. F. BOWLES, formerly scrap buyer at Los Angeles, is made assistant purchasing agent, Oakland, and H. R. BOHME, formerly Kelly's assistant, becomes assistant to purchasing agent at Kaiser Steel Mill.

Ohman *Kelly*

M. F. OHMAN assumes new post of assistant general manager of *Dow Chemical Co.'s* Western division at Pittsburg, Calif. H. H. SMITH steps from assistant production manager to Ohman's former post as division production manager.

BURTON A. OLSEN, previously vice president of *National Automotive Fibres, Inc.*, is named president of *Hobbs Battery Co.*, Oakland.

NORMAN A. EASTWOOD becomes director of research and control for *Scudder Food Products, Inc.*, Monterey Park, and *Bluebird Potato Chip Co.*, Oakland.

Meyenberg Milk Prodcts Co. elects DON L. MCCAFFEY president and general manager of both parent company and of *Old Fashion Products, Inc.*, a wholly-owned subsidiary.

L. A. ANDERSON, assistant general superintendent of *Bethlehem Pacific Coast Steel Corp.'s* South San Francisco steel plant since 1937, becomes general superintendent succeeding W. C. ESHELMAN, deceased. GEORGE W. TESKEY, assistant superintendent of Open Hearth department since 1939, succeeds CLARENCE W. JONES, retired, as superintendent of that department.

Anderson *Hitchcock*

WALLACE H. HITCHCOCK, previously general manager of *Revere Copper and Brass Inc.'s* Pacific Coast division, is elected vice president in charge of company's Pacific Coast division at Los Angeles.

M and M Wood Working Co., Portland, Ore., names RALPH G. DEMOISY woods manager of firm's Eureka plywood division.

VICTOR J. POLLOCK joins staff of *Consolidated Engineering Corp.*, Pasadena, Calif., as assistant treasurer.

Air Reduction Pacific Co., a division of *Air Reduction Co., Inc.*, appoints JACK V. EVANS manager of company's industrial relations on Pacific Coast. His headquarters will be at company's general offices in Emeryville, Calif.

Evans *Schroeder*

Soulé Steel Co. appoints OTTO SCHROEDER its general production manager in charge of all production at company plants in San Francisco, Los Angeles, Torrance, Calif., and Portland, Ore.

Round Chain Companies promote key men as follows: GERALD T. KNOTT, former assistant general manager of *Round Seattle Chain Corp.*, Seattle and Portland, is named vice president; JACK D. CAVAN, previously general manager of *Round Los Angeles Chain Corp.*, becomes general manager of *Round California Chain Co.*, South San Francisco,

Woods *Cavan* *Knott*

3537-9—Martin R. Klitten Co.—252

MASTER OF MOISTURE

Developed to withstand constant subjection to widely varying temperatures, water, steam and pressure, the Aerol Seal Wheel has completely proved itself in the plants of leading food processors throughout the country. Savings in maintenance costs alone spell extra profits for cost wise buyers.

Special design and construction of the Aerol Seal Wheel prevents foreign matter from entering the hub, and retains factory lubrication for life! Best quality live rubber tread is so compounded that it is literally impervious to the action of animal fat or brine.

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Neoprene O-rings are housed so that there is a positive air and water tight seal . . . Condensation within the hub prevented; bearings permanently adjusted. Foreign matter is excluded.

FACTORY LUBRICATED FOR LIFE!

Lubriko-Master lubricant (M-21) has unusual film strength, extremely high melting point and low cold test. Will not corrode, cake, gum or separate.

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Over Fifty Years of Service

OFFICES IN PRINCIPAL CITIES

and his place in Los Angeles is taken by LEONARD D. WOODS, JR., who has been Cavan's assistant.

LLOYD W. JEFFERY becomes general superintendent of Evaporated Operating Division of *Carnation Co.*

Goodyear Tire & Rubber Co. names ROBERT W. MANEY as assistant general manager of *Goodyear-California.* Maney was manager of firm's California plant at Los Angeles prior to this advance. In his new capacity Maney will assist with administrative and sales matters.

Colorado

LEIGH H. NORGREN is appointed plant superintendent for *C. A. Norgren Co.*, Englewood.

Leigh H. Norgren

Idaho

JOSEPH C. KIEFFER, formerly general manager for *Spokane-Idaho Mining Co.*, takes position as assistant manager of *American Smelting and Refining Co.'s* operations in Coeur d'Alene mining district.

DR. RAY E. CURRIE, Oakland, Calif., physician is named president of *Kootenai Dike Mines, Inc.*, with properties near Leonia, Idaho.

New Mexico

RUSSELL H. MATTHEWS is appointed chief of Supply and Contracts branch, Administrative Services division, Los Alamos Field Office, Atomic Energy Commission. He fills vacancy created by promotion of DANIEL L. HIGGINS to position of procurement specialist in Supply division of AEC's Santa Fe operations office in Albuquerque.

Oregon

JOHN D. DAVIS, former deputy of *Defense Electric Power Administration,* assumes duties as assistant administrator, *Bonneville Power Administration.* He succeeds D. LORING MARLETT, resigned.

J. B. GRANTHAM, since 1951 chief of physical research and development division of laboratory and head of forest products department of Oregon State College school of forestry, is named new acting managing director of *Oregon Forest Products Laboratory.* He fills this position as replacement for DR. PHIMISTER B. PROCTOR, now on military leave of absence.

Utah

HOWARD B. GUNDERSEN, supervisor of training for Utah Copper division, *Kennecott Copper Corp.*, is made assistant director of division's industrial relations. His direct supervision of Utah Copper's employee training program will continue.

HAROLD J. SHAW, assistant chief chemist of Midvale smelter, *U. S. Smelting, Refining and Mining Co.*, succeeds N. L. JENSEN, retired, as chief chemist. HUGH B. HANCHETT is promoted to fill position of assistant chief chemist.

Washington

GUY V. GRAHAM, Seattle, is elected vice president of *Libby, McNeill & Libby,* in charge of salmon operations and sales in both Seattle and Alaska.

ROBERT N. MILLER, previously on executive staff of *Preservative Paint Co.*, and vice president of its subsidiary, *Wood Beautifiers,* is appointed vice president in charge of *Olympic Stained Products Co.'s* operations and products development program, Seattle.

KENNETH FISHER, treasurer and a director of *Fisher Flouring Mills Co.*, Seattle, is made assistant general manager of that company.

H. B. MEGILL, former general manager of *Dominion Magnesium, Ltd.*, Haley, Ont., is new executive vice president and general manager of *Pacific Northwest Alloys, Inc.* Firm operates a government magnesium plant at Spokane.

Pacific American Fisheries, Bellingham salmon packer, elects EDWARD E. WILLKIE to post of president. He succeeds JACK GREEN, resigned due to ill health.

Wyoming

EARL R. MAIZE, formerly head of *National Coal Association's* safety division, becomes general manager of operations for *Sheridan-Wyoming Coal Co.* at Monarch.

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ASSOCIATIONS ELECT

National Association of Purchasing Agents: President, H. W. CHRISTENSEN, director of purchases for *Columbia-Geneva Steel Division, United States Steel Company,* San Francisco, Calif.

H. W. Christensen

Liquefied Petroleum Gas Association: President, FOSTER N. MABEE, president of *Colorado Natural Gas & Fuel Co.,* Denver, Colo.; first vice president, C. M. AMBROSE, JR., president *Liquefied Gas Corp.,* Seattle.

National Association of Cost Accountants, San Francisco Chapter: President, RALPH B. KNOTT, vice president in charge of finance, *Fibreboard Products, Inc.;* first vice president, HEROLD H. NEHLS, OPS; second vice president, GEORGE S. BROWN, *Montebello Wine Co.;* treasurer, ESTHER D. SCRIVEN, *E. W. McLellan Co.;* secretary, VERNON V. RUHS, *Crown Zellerbach Corp.*

American Gear Manufacturers Association: President, ROY CRAWSHAW, *Western Gear Works,* Lynwood, Calif.

Roy Crawshaw

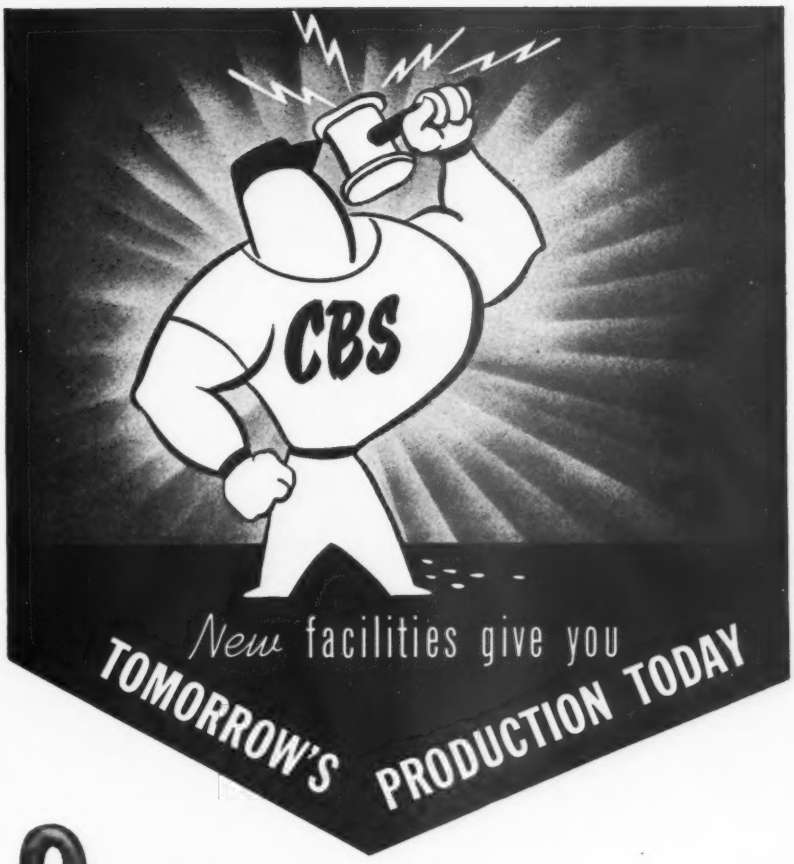
American Tungsten Association: President, CHARLES SEGERSTROM, president, *Nevada-Massachusetts Co. in Nevada.*

Washington Society of Professional Engineers, Spokane Chapter: President, KENDALL M. WOOD, consulting mechanical engineer; vice president, ALBERT GRUBER, electrical engineer with *Washington Water Power Co.;* secretary-treasurer, WILLIAM K. STOCKDALE, traffic engineer, City of Spokane; state director, JACK REEVES, consulting electrical and mechanical engineer.

Credit Managers Association of Southern California: Chairman, industrial division, O. E. HARING, credit manager, *Sterling Electric Motors, Inc.,* Los Angeles.

Gas Appliance Manufacturers Association: Second vice president, T. T. ARDEN, vice president, *Grayson Controls division, Robertshaw-Fulton Controls Co.,* Lynwood, Cal.

California Oil Producers, conservation committee: Chairman, E. J. BARTOSH, *Bankline Oil Company;* first vice chairman, C. A. DAVIS, *Richfield Oil Corp.;* second vice chairman, R. J. STEPHENS, *Kern Oil Company, Ltd.;* secretary, L. R. ROGERS, *Superior Oil Company.*



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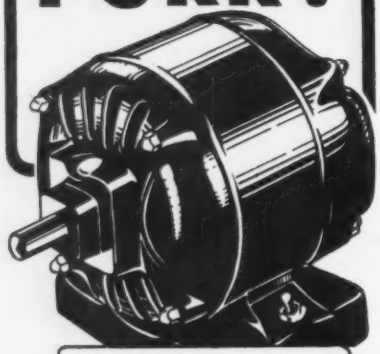

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Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

GEORGE A. STREVER is made assistant to sales manager of *Roylyn, Inc.*, Glendale, Calif. manufacturer of quick couplings, valves and coupling valves, filler unit assemblies and allied products.

RICHARD B. DAVIS is appointed sales manager for industrial supply division of *Hendrie & Bolthoff Co.*, Thor products distributor in Denver, Colo.

Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore., manufacturer of industrial lift trucks and tractor equipment, assigns PETER LEWIS to newly created post of motor freight sales representative.

Farr Co., Los Angeles filter maker, appoints DONALD SOUTHARD, Denver, Colo., as manufacturers' representative to cover Colorado and Wyoming territory.

Sales Engineering Co., Inc., 875 Legrand St., Salt Lake City, Utah, is appointed exclusive sales representative in Mountain States area for *American-Fort Pitt Spring division, H. K. Porter Co., Inc.*, Pittsburgh, Pa. producer of hot and cold wound springs for industrial and railroad applications. Sales-servicing territory includes Utah, Nevada, Wyoming, Montana and Idaho.

THEODORE E. MEYERS is assigned as a sales representative to Los Angeles district office of *Allis-Chalmers Manufacturing Co.'s* general machinery division.

JAMES V. WINKLER, formerly with magnesium sales in *Dow Chemical Co.'s* Los Angeles sales office, is named head of magnesium sales department's technical service and development group. R. D. SWEET, of Dow Chemical Co.'s magnesium wrought product sales, joins magnesium sales staff in firm's Los Angeles office.

Sweet

Carney

Supreme Products, Inc., Chicago chuck manufacturer, names TOM CARNEY, SR., of *T. C. Carney Co.*, 1015 Santa Fe Ave., Los Angeles, as a firm representative. JACK DOWLING, 2437 Monta Vista Place, Seattle, is new Supreme products sales representative in Washington, Oregon, Idaho and western Montana.

Sparkler Manufacturing Co., Mundelein, Ill., manufacturer of filtration equipment, opens a new West Coast branch office and warehouse at 612 N. San Vicente Blvd., Los Angeles 46, Calif. RICHARD E. SHIELDS is appointed West Coast sales manager.

HUBERT O. FRY is named manager of *U. S. Rubber Co.'s* new West Coast textile division.

CEC Instruments, Inc., is formed as a subsidiary organization to handle sales and service work on instruments manufactured by *Consolidated Engineering Corp.* of Pasadena, Calif. Main office of CEC Instruments, Inc., is at Consolidated's plant at 300 N. Sierra Madre Villa, Pasadena.

Electric Steel Foundry, stainless steel distributor with offices covering West Coast, is appointed a West Coast distributor for *Rigidized Metals Corp.* of Buffalo, New York.

Fluor Corp., Ltd., Los Angeles 22, Calif., names JACK MCKAY as manager of sales promotion department. He will be in charge of advertising, publicity, exhibits and all phases of sales promotion.

McKay

Parsons

Pacific Scientific Co., industrial instrument representative with offices in Los Angeles, San Francisco, Portland and Seattle makes the following appointments: DECKER G. MCALLISTER, San Francisco, president and general manager; CHARLES H. WEBBER, vice president and assistant general manager, and WILLIAM J. PARSONS, vice president in charge of industrial division. This department is now building heat treating furnaces in an expanded Los Angeles plant.

MARSHAL C. FARQUHAR of *American Potash & Chemical Corp.*, Trona, Calif., and DAVID D. PARRISH, JR., of *Lockheed Aircraft Corp.'s* chemical laboratories join *Truesdail Laboratories, Inc.*, 4101-4107 N. Figueroa St., Los Angeles 65.

EDGAR L. DEMAREST transfers from New York district sales office of *Buflovak Equipment* division of *Blaw-Knox Co.*, producer of chemical and food processing machinery, milk dryers and evaporators, to Buflovak's West Coast office at 1706 Broadway, Oakland 12, Calif., where he assumes duties as West Coast district manager.

ED FALLS, formerly *Motorola Inc.'s* communications and electronics division zone manager for Southern California, is selected

as regional manager for division's Southwest sales area, including New Mexico. He succeeds JOHN JIPP, who is appointed manager of company's new West Coast parts and service department.

LLOYD A. BLANKENSHIP joins *Oakite Products, Inc.'s* petroleum service division. Operating from company's Los Angeles offices, he will assist its Pacific Coast field representatives in providing additional technical advisory service on petroleum-industry cleaning and related problems.

Blankenship *Fogman*

HAROLD F. FOGMAN leaves his position with *Webster Brinkley Co.*, Seattle, Wash., as assistant plant superintendent and chief inspector, to become sales representative for Steel Strapping division of *The Stanley Works*, New Britain, Conn., in states of Washington and Oregon. His headquarters will be in Seattle.

Baker Steel & Tube Co., Los Angeles, names HARRY E. BYERRUM as sales manager. Byerrum has been a member of this company's sales staff for the past 11 years.

Officers for newly formed *Rich and Proctor Steel Co.* at 841 73rd Ave., Oakland, Calif., are GUSTAV R. RICH, president; EDWIN E. PROCTOR, vice president; and SIGMUND T. RICH, secretary-treasurer.

Westinghouse Electric Corp. names DAVID C. FULTON, formerly application engineer for company in Portland, as Pacific Coast machinery electrification manager with headquarters in San Francisco. He succeeds CLAUDE HERBERT, who takes over special assignments in district. JOSEPH A. TUDOR, a Westinghouse consultant on electrification to lumber, pulp and paper industries in northwestern U. S., becomes industrial application engineer, retaining his headquarters in Westinghouse's Portland office.

Conrac, Inc., manufacturer of television receiving sets, utility monitors and other electronic equipment, opens new sales and display room at 7264 Melrose Ave., Hollywood, Calif.

Motorola, Inc.'s communications and electronics division opens a new West Coast parts and service department at 811 South B St., San Mateo, Calif. JOHN JIPP, recently sales manager of division's southwestern states region, is head of department.

JOSEPH DEVINE, *Westinghouse Electric Corp.* engineer until recently assigned to Arizona electric utilities, is appointed application engineer in charge of company's newly-established office in Boise, Idaho. His headquarters are in Westinghouse Electric Supply Co.'s building at 710 Front St., Boise. ROY D. CAMERON, former Central California salesman for *Minnesota Mining and Manufacturing Co.*, is named sales promotion representative for Westinghouse lamp division's Pacific Coast district which includes states of California, Oregon, Idaho, Utah, Arizona and Washington.

Rocky Mountain Machinery Co., Salt Lake City, Utah, is named new distributor in Utah and southeastern Idaho for *New York Belting and Packing Co.*, Passaic, N. J., manufacturer of belting, hose, packing and other industrial rubber goods.

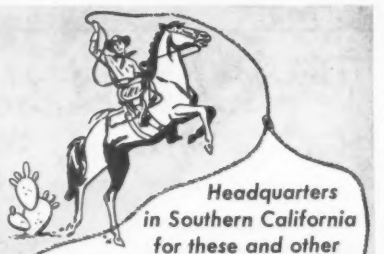
A new wholesale steel firm, *Industrial Supply Co. of Arizona*, organized to provide steel for construction trade, mines, lumber mills and steel fabricators, establishes quarters at 2626 E. Washington St., Phoenix, Ariz.

Channing Wallace Gilson, industrial designer specializing in product design, transportation, architectural, furniture, and packaging, opens his new office at 4035 Cumberland Ave., Los Angeles 27, Calif.

CONRAD R. SEIM joins *Montague-Harris & Co.* as a machine tool specialist in customer servicing. He works out of Los Angeles office.

National Electric Products Corp., Pittsburgh, Pa., purchases *The Bacon Agency*, Denver, and establishes a Denver district office. ARTHUR E. BACON, JR., formerly manager of The Bacon Agency, is appointed district sales manager covering eastern Montana, Wyoming, Colorado and New Mexico.

Samson Sales Co., San Francisco, is appointed to handle Nevada and Northern California areas for *Ajax Electric Co.*, Frankford and Delaware Ave., Philadelphia 23, Pa., manufacturer of electric salt bath furnaces for heat treating of metals. Further Ajax sales representative changes include ap-



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The Lufkin Line

By VIC FAWCETT

OUR 50th ANNIVERSARY

Vic Fawcett

The ***"Lufkin Line"*** magazine, commemorating the 50th anniversary of ***Lufkin Foundry & Machine Company*** is arriving this week at the desk of friends and customers across the country, East, West, North and South. This issue recounts the history of a little repair shop. The date—February 17, 1902. The place—Lufkin, Texas.

Virginia R. Allen, editor, has presented the ***Lufkin*** story in excellent form, and with grateful acknowledgement, I would like to quote a paragraph or two:

> "Half a century ago, a group of five men met on February 17, 1902 to organize a little repair shop for railroad and sawmill machinery. That shop was the birthplace of an enterprise.
>
> **"Today that little company has grown to what is considered the largest manufacturer of oilfield equipment in the South. Its products, in addition to oilfield equipment, include truck trailers, industrial reduction gears, commercial castings, and are known the world over.**
>
> "The story of an institution is the story of a man. And as the institution grows, it becomes the story of many men. The story begins with a group of five—F. Kavanaugh, J. H. Kurth, Sr., S. W. Henderson, Sr., F. Kavanaugh, Jr., and Eli Wiener.
>
> **"It was on July 10th, 1905, that another character entered into our story. He was a tall, dynamic young man who hailed from Wisconsin, but who had an abiding love for Texas and her beautifully timbered sections. He was W. C. Trout, a traveling representative for Allis-Chalmers Company.**
>
> "On his frequent trips to ***Lufkin*** he had noted industrial possibilities afforded by a small town with plenty of room for expansion, an adequate supply of labor, and abundant natural resources combined with the relative low cost of living which a small town affords.
>
> "From that day until his passing on April 24, 1947, he was the "spark plug" if you please, the strong, farvisioned, humanitarian who molded and shaped the policies of this company with loving hands and inspired wisdom."

Yes, it's an interesting story—with a full measure of all the pioneering spirit that builds a great organization. It's great to be a part of such an organization. And the folks who use ***Lufkin*** products have made all this possible with their loyal support.

Vic Fawcett

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5959 S. Alameda St., Los Angeles 1, Calif.
AGENCY—ADAM HILL CO.
244 - 9th St., San Francisco, Calif.

Dallas **Lufkin, Texas** **New York**

pointments of *Richards-Conant,* Denver, Colo., to cover Wyoming, Colorado, Utah, Arizona and New Mexico, and W. E. HARTLEY, Seattle, to handle Ajax sales in Washington, Oregon, Montana and Idaho.

D. B. Smith—Chemicals, 1016 First Ave. South, Seattle 4, Wash., is now direct representative in Seattle area for *Morehouse Industries of Los Angeles,* manufacturer of specialized grinding and processing equipment for paint, oil, ink, chemical, drug and food industries.

Pioneer Rubber Mills completes a new one-story concrete and brick building at 5001 Hampton St., Vernon, Calif., as headquarters for its Los Angeles area activities. A full inventory of Pioneer's products will be stocked including industrial hose, belting, fire hose and packing. W. S. LONG is general manager of Los Angeles branch.

Arnold Machinery Co., Inc., Salt Lake City, establishes a branch store in Idaho Falls, Idaho, to supply needs of materials handling equipment users in that area. EUGENE SANDELL is manager and FRANK HOAGLUND is sales engineer for territory. Arnold Machinery Co. is exclusive dealer in area for trucks and cranes manufactured by *Hyster Co.* of Portland, Ore.

ELKAN OFFER, formerly assistant general manager of Seattle branch, *Dulien Steel Products, Inc.,* becomes marine division sales manager for *Zidell Machinery & Supply Co.* of Portland, Oregon.

Baker Steel and Tube Co. names VICTOR A. INDIG, San Francisco, as its representative in San Francisco and Bay Area.

JOHN O. PAULL is named branch manager in Los Angeles and LEE APLIN is named branch manager in San Francisco for industrial division of *Minneapolis-Honeywell Regulator Co.*

CARL H. KELLER becomes welding engineer at *Harnischfeger Corp.'s* Seattle branch. GEORGE A. GLASS, formerly office manager for Harnischfeger Corp.'s branch office at Seattle, transfers to Spokane as sales engineer covering all P&H products except diesel engines and prefabricated houses. His territory includes eastern Washington, Idaho, Montana, northern Wyoming, and Alberta and eastern British Columbia in Canada.

Republic Manufacturing Co., manufacturer of Remco hydraulic valves, appoints *Metropolitan Supply Co.,* 353 E. 2nd St., Los Angeles, distributor for Republic products in Southern California area.

Horace Blackman Co., formed plastics manufacturer, 287 S. Robertson Blvd., Beverly Hills, Calif., is now California agent for new rigid poly-vinylchloride, Boltaron 6200.

Warehouse location for *Gerrard Steel Strapping division, U. S. Steel Co.,* in Portland, Ore., is moved to 1516 N.W. Thurman St., Portland 9.

Hickinbotham Bros., Ltd., Stockton, Calif., is appointed distributor in Stockton area for products of *Diamond Chain Co., Inc.,* Indianapolis, Ind., manufacturer of roller chains, sprockets and flexible shaft couplings.

Enthone, Inc., New Haven, Conn., grants *L. H. Butcher Co.,* industrial chemical supplier, exclusive license to manufacture Enthone products in Los Angeles to serve Pacific Coast and British Columbia. Compounds are used for plating on aluminum, blackening metals, derusting and pickling, plate and paint stripping, and metal cleaning. L. H. Butcher Co. will distribute these products in Washington, Oregon, Idaho, California, Nevada, Utah, Arizona and New Mexico from branch offices in Seattle, Portland, San Francisco and Los Angeles.

The Stearns Co., Los Angeles, is appointed Western representative for *Curtis-Wright Corp.* metals processing division of Buffalo, New York.

JAMES W. KINCAID is appointed sales manager of *Crown Zellerbach Corp.'s* Multiwall bag sales department. He takes over duties of H. O. NICHOLS, who is on a leave of absence due to illness.

James W. Kincaid

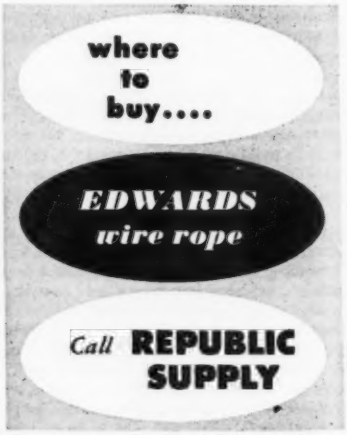
Glen L. Codman Co., Inc., 10521 Pearmain St., Oakland 3, Calif., is made direct factory agent for *Coles Cranes, Inc.,* Chicago, Ill., manufacturer of materials handling equipment.

JAMES R. TURNBULL becomes assistant general sales manager of *Monsanto Chemical Co.'s* Western division, San Francisco, Calif.

DX Radio Products Co., Chicago manufacturer of toroidal coils, deflection yoies and ion traps, appoints *John B. Tubergen Co.,* Los Angeles, its representative in Southern California area.

Marion Instrument Co., Manchester, N. H., producer of panel and other type instruments selects *E. V. Roberts & Associates,* Los Angeles, to represent it in California, Arizona, New Mexico and Nevada.

Electronic Engineering Associates, Ltd., field application engineering company for *Sierra Electronic Laboratories,* San Carlos, Calif., names *Kittleson Co.* of Los Angeles



3537-17—Martin R. Klitten Co.—252

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All advertisements in this section are ½ inch short of contracted space to allow for borders and composition.

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Rates are $7.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

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1—General Electric steam turbine, 200 KW, 5529 RPM, Type DS-60-4 stage, 160# pressure, exhaust pressure 2" absolute, No. 40798.

1—Worthington Surface Condenser, Size 300 sq. ft., complete with 8" atmospheric relief valve (less pump).

1—General Electric DC Generator, Model 15G706, Frame 5, Type EF, Form EB, 24 amp, 3 KW, 1200 RPM, No. 1702735 (Exciter) attached to generator.

1—General Electric Speed Reducer, Type S58, 5529 to 1200 RPM.

1—Ansdale Oil Cooler, Size H2, (oil feed to turbine).

1—General Electric Switchboard including DC voltmeter, AC kilowatt meter, AC and DC Ammeters, resistance rheostat, voltage regulator, watt hour meter, 3 potential transformers 400 Amp, 3 current transformers 480-115 volt, circuit breaker hand operated, voltage regulator—carbon pile, exciter armature voltage stabilizer, field switch.

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to represent it in California and Arizona for its carrier-type screen gauge amplifier, flush mounting pressure cell and other electronic items.

Olin Cellophane division of *Ecusta Paper Corp.*, a subsidiary of *Olin Industries, Inc.*, names *Zellerbach Paper Co.*, San Francisco, Western and Pacific Coast area distributor for Olin cellophane.

Durant Manufacturing Company, Milwaukee, maker of counting and measuring machines, has appointed the following new Pacific Coast representatives: *James C. Hale Company,* San Francisco, *Paul J. Short,* Portland, *A. W. Nash Co.,* Los Angeles.

Hobart Bros. & Associates, 200 Davis St., San Francisco 11, Calif., YUkon 2-3258, makes two additions to its sales staff: ROBIN HOBART and JIM ENZENSPERGER, who will devote most of their time to Polyken industrial tapes manufactured by *Bauer & Black Co.*, Chicago, Ill.

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Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

A. P. JOHNSTON CO.
1845 E. 57th St., Los Angeles 58

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IS GOOD ANYTIME!

Unusual specifications for size or quality in flat rolled spring steel often involve quantities insufficient for economic mill production and yet sufficiently uncommon as not to be found in the ordinary steel warehouse stock. This sometimes results in a difficult procurement problem. We are attempting to minimize this difficulty by developing the largest practical stock of all grades, tempers, sizes, and finishes of spring steel—from dead soft annealed to tempered, polished, and colored. We believe we now have more different sizes and grades of flat rolled spring steel products in our Los Angeles Warehouse than can be found any place in the West. This mill-connected warehouse assures a continuing, dependable source of supply. We solicit your inquiries and will gladly provide samples.

FOR FAST WAREHOUSE SERVICE, not only spring steel, but all of these cold rolled strip steel products and services are available to you—quick. Low carbon cold rolled strip • Cold rolled electro zinc coated strip • Cold rolled shim steel • High carbon annealed spring steel • Hardened and tempered spring steel • Cold rolled annealed stainless strip • Cold rolled hi-tensile stainless strip • Hot dipped galvanized sheets • Custom slitting service for your metals • Coils—cut lengths.

Telephone PLeasant 3-1291

the Cold Metal Products co.
of *California*

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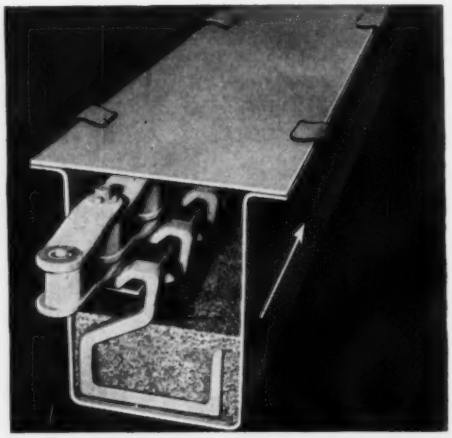

At this modern plant, a completely mechanized S-A bulk handling system moves chemicals from rail cars to storage at lowest cost per ton.

One part of the handling system designed, built and installed by S-A engineers consists of a closed-circuit REDLER conveyor. The closed-circuit design, a unique REDLER feature, permits *selective distribution* to any outlet point and re-circulation of surplus material in the conveyor. REDLER compactness permitted installation in very restricted space.

Low cost per ton handled is the true measure of a successful conveyor installation. S-A engineers, with 50 years of experience and a *complete* line of bulk handling equipment, are ready to help you reach the goal of efficiency at the lowest possible cost. Consult with S-A on your next bulk handling problem . . . there is no obligation.

REDLER CLOSED-CIRCUIT CHEMICAL CONVEYORS

Efficient system of conveyors and elevators unloads and moves lime, alum and other bulk chemicals to storage. Because system is totally enclosed and dust-tight, it protects materials from contamination and prevents loss by spillage. One unit in the system, a closed-circuit REDLER conveyor, makes a complete circuit over a battery of six storage tanks discharging the various chemicals into the right tanks. Material in the conveyor can be re-circulated until needed at any selected discharge outlet.

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Bulk Material Handling Equipment